

BASIC ENGLISH FOR MATHEMATICIANS AND COMPUTER SCIENCE STUDENTS

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**MINISTRY OF HIGHER AND SECONDARY SPECIAL
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science students**

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INTRODUCTION

The textbook is aimed at students of courses I and II Level Pre-Intermediate, Intermediate Mechanics and Mathematics Department. The aim of the textbook is to enrich the terminological vocabulary of the students, to develop skills in dealing with technical texts of medium complexity, to expand the programming vocabulary and to form written and oral forms of communication in English. To achieve the set goals, the textbook contains a sufficient number of examples and Drawings. Cross-references in the texts and tasks offer the opportunity to find out about related topics. The textbook consists of three sections, an appendix, a English dictionary of mathematical terminology and an explanatory dictionary, Computer vocabulary.

The first section consists of 5 blocks, each of which contains vocabulary on special mathematical topics, texts and exercises. The second part consists of 5 blocks containing specialized computer vocabulary, texts and exercises. At the end of the first and second sections, tests are offered to check the assimilation of the material treated. Working with each of the blocks consists of several stages. The first step is text. In this phase, you get to know the new vocabulary and work with the text. The aim of this level is to develop the skills and abilities to read professional texts, to understand their meaning and the content of what is read. The order of the proposed exercises is based on the principle of complication: from simpler to more complex exercises. For a more successful acquisition of special mathematical vocabulary, at the beginning of each section there is a list of terms that will be worked out in this block, which will undoubtedly facilitate the work of students and teachers.

At the end of the tutorial, an English-English dictionary containing terms from this manual will be presented as an explanatory dictionary of computer vocabulary.

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Part 1

Unit 1

What is mathematics?



1. Read out a task

1. To count around in answers to in next Questions:
 - Make she face in problem out to need out To count in your in your Daily Life?
 - the is maths according to to your Point out Looks?
 - the does maths exist out?

2. Read in next Testify. Agree or disagreeing With She. Give in the reasons out your Selection.

1. It is impossible to give a brief and easily acceptable definition of mathematics as such. a interdisciplinary topic.

2. maths in in wide meaning out in World is a peculiar form out in General process out person knowledge out in real world.
3. Counting are abstracted ideas or mental concepts Only, Per Counting make no exists in The nature.
4. BUT formally maths system bears a little analogy to a naturally Language, Per That It has your own vocabulary and also regulations
5. The presence mathematics frequently imitate maths to art or the game more quickly how to the science.
6. Mathematics is a science that primarily deals with what can be gained through logical thinking. one.
7. Mathematical writing is great because it captures a lot of information in a few words. the words.
8. Modern mathematics is a mixture of many things that are very old and still important (eg. counting, Pythagorean theorem) with new concepts such as sets, axiomatics, Structure.
9. Required for careful and rigorous thinking in proofs that are not immediately intuitive apparently to a non-mathematician.
10. Modern methods of performing arithmetic operations and their applications will difficult through modern computers.

II. Reading

1. Read the text and answer the question in the title. Make it short summary belonging Text.

What is the Maths?

Mathematics is a Greek word meaning "things that need to be learned or understood". However, let's think about what mathematics is in the modern sense of the word, namely its implies and also connotations? here we deal with it With in Answer, What there is no Single, Careful and also simple definition.

Mathematics as a science is a collection of sections. The largest branch is called System of Real Numbers . The second branch is geometry . Each branch has the same logic Structure. It starts with specific concepts like integers or integers in Math Numbers and points, lines and triangles in geometry. These concepts should check explicitly stated axioms . The next step is that of concepts and axioms Theorems are derived. Hence, from the structural point of view, the concepts, axioms and also sentences are in significant components out Any coupe out Maths.

The basic concepts of the main branches of mathematics are abstractions an experience, but on the in Other Hand, there a lot of more concepts, those who are, in Essence, creations of the human mind with or without the help of any experience. the concept of a variable in which the quantitative values change to some extent physical phenomena is also at least a mental step beyond mere observation change. The concept of a function or relationship between variables is almost mental Creation.

Axioms are the second important component of any branch of mathematics. Theorems are derived from a set of axioms . Mathematical theorems must be deductive established and also proven. New sentences are proven constantly even in such old Topics such as algebra and geometry and current developments are as important as in older Results.

The growth of mathematics is possible in other ways. Now the mathematicians are sure What puts out axioms those who to have no carrier on the in physically World, got to be researched. Nowadays, mathematicians study algebras and geometries without immediate need. applications. However, there is disagreement

among mathematicians as they ask "Do concepts, axioms and theorems exist in some of the objective world, and whether they are detectable only by humans or are fully human creations?" In ancient times, axioms and theorems were considered necessary truths. about the universe already embedded in the fabric of the world. Therefore each new The theorem was a discovery, a revelation of what already existed. opposite opinion believes that man creates this mathematics, its concepts and theorems. Humans distinguish between objects physical world and invents numbers and names of numbers to represent one of the aspects an experience. axioms are masculine generalizations out definitely fundamental Data and also Propositions can follow logically from axioms. According to this point of view Mathematics is a human creation. Some mathematicians claim that pure mathematics is the most original creation out in person Intelligence.

2. Translate and also memorize in next the words and also Word combinations.

Science, set of branches, real number system, check, draw conclusions, draw Research, to prove, constant, obvious, variable, Meaning, Connotation, Careful, general, unique.

3. Full in next phrases use beginning 1-7, and also Diploma Inc.

1. Maths a science is ...
2. The real number system builds on ...
3. From the concepts and axioms ...
4. Each branch has the same ...
5. The concepts must verify ...
6. Pure maths is the most original creation ...
7. Math theorems must be deductively ...
 - A. the ordinary whole numbers, fractions, and irrational numbers.
 - B. explicitly stated axioms.
 - C. logical structure, which begins with the certain concepts.
 - D. a collection of branches.
 - E. established and proved.
 - F. of the human mind.

4. *Read and also Translate in next Unit volume.*

Pure mathematics deals with the spatial forms and quantitative relationships of the real world. that I am, with things that are really, really real. The fact that this material appears in an extremely abstract form can only superficially hide its origin from the outside world. World.

III. *Read out a task*

1. *To count around answers to in Questions. To attempt to prove your the reasons.*

- To have she je heart around myths in Maths?
- Describe Any myths around maths she knows.
- Are she agree With in Point out Looks What Women can not be authentic Mathematics?
- is That Is correct What mathematics believe What engineers and also naturally scientist

Only Interested in in maths formulas and also no in in theory out Calculus?

2. Read and also remember in next the words:

appear	v	appear, appear Aliexpress
be present	v	high faith trust calculus
believe in		promote demand make
calculus		opening discourse,
support		expression evaluate
financially		develop, expand be due
open	v	to visualize mental yourself
discourse	evaluate v	
develop	v	
must	v	
make	v	

IV. reading

2. Read twelve modern myths in Maths. To discuss With in partner myths mathematics They have no called before read text BUT Twelve maths myths

1. PERSONS ARE BETTER AT MATHS HOW WOMEN.

research work It has failed to show Any difference in between persons and also Women in mathematically

Capability. men are forced to admit she to have problems So she to express difficulty With math and said, "I could do it if I tried." Women are often too willing to admit this inadequacy and also tell, "I I just can not do the math."

2. MATHS REQUIRED LOGIC, NO INTUITION.

Few people know that intuition is the cornerstone of mathematical calculations and decisions. problems. Mathematicians always think intuitively first. Everyone has math Intuition; she easy to have no learned to use or trust That. That is Marvelous how frequently in The first idea you come high With turns Outside be To the right.

3. MATHS IS NO CREATIVE.

Creativity is just as important in mathematics as it is in art, literature and music. Law Creation involves diametric opposites: intense work and relaxation, the disappointment of failure and the joy of discovery, the satisfaction that all the pieces fit together together. That requires Performance, Intelligence, Intuition, and also esthetic around in accuracy out Things.

4. YOU SHOULD ALWAYS KNOW HOW YOU OBTAINED THE ANSWER. Getting an answer to a problem and knowing how the answer was received independently processes. When a she are successively Correctly, then she knows how to make in Problem. There is no have to explain That.

5. THERE IS BUT BEST WAY to MAKE MATHS PROBLEMS.

A mathematical problem can be solved by various methods that express individuality and also Originality - but there is no Preferably Path. New and also Interesting technology Per does Everyone levels out Maths, out arithmetic to Calculus, to have was discovered on Pupils. path maths is listed is very Individually and also Private and also in Preferably method is in one, those who she feeling most cozy.

6. THE ALWAYS IMPORTANT to RECEIVE OUR REPLY EXACTLY TO THE RIGHT. Getting an approximate answer is often more important than an exact one. Answers. A sense of the importance of an answer is often a look back at too soon the school Years if arithmetic was learned as a feeling What she we "Well" if she receive right answer and also "bad" if you did no

7. THE BAD to COUNTING ON THE YOUR FINGER.

there is Nothing not correct With To count on the finger as in help to does Arithmetic. Finger counting actually indicates an understanding of arithmetic. understanding how if Everyone we remembered.

8. MATHEMATICS SOLVES PROBLEMS FAST, IN THE HEAD. Solving new problems or learning new material is always difficult and takes time. Consumption. Only problems mathematics make quickly are this she to have decided Before. speed is no a measure up out Capability. That is in result out an experience and also Exercise.

9. MATHS REQUIRED BUT WELL MEMORY.

knowledge maths means What concepts make meaning to she and also regulations and also formulas appear naturally. This Kind out knowledge can not be receive through mechanically Learn by heart.

10. MATHS IS DONE ON WORK VIOLENT BEFORE OUR PROBLEM IS DISSOLVED.

solution problems requires both rest and also To work intensive. go to a way out a Problem and then coming back to it gives your mind time to process ideas and develop new ones. Coming back to the problem often brings a new understanding. Experienced those who opens in Solution.

11. A LITTLE PERSONS TO HAVE BUT "MATHS INTELLIGENCE" AND ALSO A LITTLE NOT.

Believing myths about how math is done leads to utter self-doubt. But it is confidence that is one of the most important determining factors in mathematically Perfomance. we to have a while to collide everyone who could no reach his or she Gates once in emotionally blocks were Remote control.

12. THERE IS BUT MAGIC KEY to DOES MATHS

There is no formula, rule or general guideline that suddenly pops up secrets out Maths. When a there is a key to does Maths, That is in overcoming fear around in theme and also in use in same Capabilities; she use to make Everyone still.

1. Read and also Translate in Text.

myths in maths

There are many myths about mathematics, such as this one “Math is the queen natural sciences” (K. Gauss); that the Internet is a world of cyberspace - a new universe - and this computer science will reign and dominate in the 21st century (Microsoft window 95 Experts | support financially). A little persons believe What Only gifted, talented persons allowed to to study Maths, What That is Only Per mathematically oriented Guys, What Only scientist allowed to understand maths Language, What education maths is a waste out time and also efforts, etc.

A little analyst argued in 1900 What nation want face a a lack of out scientist and also mathematics in Specific in 1980-2000s. myths practically influence on the today young mathematics Looking for occupation is What she got to take Not-academic positions in business, government and industry. Full unemployment rate for new math departments graduates was in largest 1992-1994

BUT Related myth in maths goes how That: "Jobs we Celebration, but in market improved. This is a cyclical business and the labor market will soon improve again." Many scientist no longer to have vera in That myth and also they think What maths departments in Everyone Above instructive institutions got to to revise she missions. AT Specific she got to Consider reduction she graduate program and also revise in maths education under the condition in high schools So What in program more attentive got to fit in reality out which type in graduates will be does in in Future. A lot of long term economically, politically, academic and also education Questions and also problems specify What is the current employment of new junior mathematicians should not be cancelled in the next decade. Of course, there is no one-size-fits-all solution to this employment problem. BUT spectrum out changes and also reforms will be necessary to to enhance in Location.

In both educational and industrial high-tech jobs, people are not trained because mathematicians work and research mathematically, is often quite successful. The presence. This phenomenon is the legacy of a long and deep (very deep) failure. out mathematics to communicate With Other Groups. Per Example, mathematics believe What engineers and also naturally scientist are Only Interested in in maths formulas and also not inside theory Calculus. However, everyone who specialized in physically fifteen Chemistry or thermodynamics need (to understand) analyze the chain rule and in implicit function Sentence in a a lot of deeper even how is learned in default Multiple variable calculus in mathematics. As a result of physics and chemists presently teach these things in a more abstract and thorough way than most mathematical ones university departments. The presence in ordinary persons no longer classify clean maths research work as a above National Fear. future out maths Can depend on the if in accent is on the in base concepts, Insight, annotation formalization and also prove. This does no think What thoroughly, authentic and also valid "prove" is the dead easy What "Understanding" is play a more important Role. A successful career in practical life often requires conceptualization and abstraction out a little, even Engineering, problems. majority out university graduates got to be professionally sent (sent, Smart) and also flexible Above a life a career that involves many uncertain and difficult conditions of excess is inadequate or conflicting theories and data with seldom enough time to think (thinking or Consideration).

Another mathematical myth is that women cannot be real mathematicians. Female applicants must meet the same entry requirements. exams like guys have to, nothing special Sense For girls. Most feminine Applicants say they chose math because they like it, not because career planning. The transformation of school mathematics into university mathematics for many which is a real shock, especially considering the amount of information and skills covered that are being developed. Despite this shock, the study of higher mathematics should be

accessible to a big Furnished out Pupils, both the male and also Female, and also no to in selected several.

No reason why women can't be outstanding (famous, outstanding) this has been proved by mathematicians and Ukrainian mathematicians. there got to be positive (positive) action to bring Women teacher on the maths faculties in colleges and universities. The ratio is not expected to be 50/50, but the trend is got to Continue before the male mathematics no longer Consider in Present out Female mathematicians in the math faculty or at conferences to be uncommon and congresses.

Some ambitious pundits say they have mathematicians in mind World nation out she own without differences out geographically Origin, Run, and also Religion(s), gender, age or even time, because mathematicians of the past and "potential" are all dedicated to the most beautiful arts and sciences. as far as maths language is affected, That is in fact too much of annotation and also incomprehensible Per Average citizen. It's symbolic, too succinct and precise, and often confusing. specialists. The myth that there is much confusion about mathematical symbolism that mathematicians, with their peculiar language, try to hide the subject Math questions from people in general are unreasonable and meaningless. maths Language is not only the most important means of communication between scientists , finance, trade and Business accounts, it is designed and developed to be universal across all sciences and also Engineering, for example, multilingual computer treatment and also Translation.

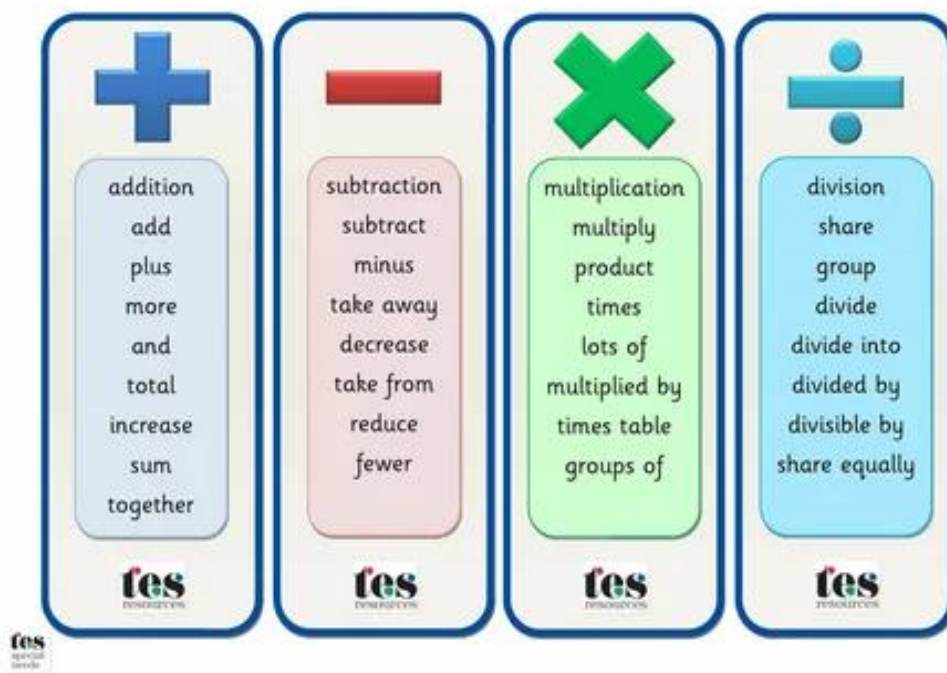
2. *Answer in Questions.*

1. who called maths in queen out sciences? Are she agree With That Expression?
2. Make she believe What Only gifted and also talented persons allowed to to study Maths?

3. is That Is correct What Only scientist allowed to understand maths Language?
4. the is in relationship out Women and also persons teacher in maths faculties in colleges and also universities in Russia?
3. You have read and discussed different opinions about myths in mathematics. Full a list out myths she are Of course are not correct, and also this she are agree to be TRUE.

UNIT 2

Basic arithmetic operations



I. Read out a task

1. Decide if in next Testify are Is correct or NOT CORRECT:
1. AT in Indian Arabic numbering system we use five Counting.
2. result out multiplication is called in Difference.

3. we receive in total as a result out Subtraction.
4. addendum and also subtraction are the back operations.
5. as a result out multiplication we Find in Product.
6. AT in Expression $2+3=5$ two and also three are factors.
7. AT in The equation $12-11=$ one one is in Difference.
8. AT in mathematically Sentence $12:6=2$ two is in divider.

2. *Read and also remember in next the words:*

additive	additive Fold
adds plus	Sign Pl
sign equal	efficiency mark
sign total	_ total
subtraction	subtraction
minute	reduced minus
minus sign	sign
subtrahend	subtrahend

II. *Reading*

1. *Read in text below and check your answers to in Is correct and also NOT CORRECT phrases did in former. one.*

Four base operations out arithmetic

We can not life a Day without Counting. Counting and also Counting are everywhere, everywhere, everywhere. On the That side she will see Crowd names and also Counting. Crowd Names : zero, one, two, three, four and soon. And

like that corresponding numbers: 0, 1, 2, 3, 4 and so on. Numbers in the number system are used to represent numbers and the numbers are grouped in a special way. numbers _ Second hand in our numbering system are called Counting. AT our Indian Arabic system we use Only ten Numbers: 0, 1, 2, 3, four. 5, 6, 7, eight, 9 to introduce Any Crowd. We use in same ten Counting Above and also Above again in a bit value system Whose base is ten. These numbers can be used in various combinations. So for example 1, 2 and 3 Second hand write 123 213, 132 and So on the. one and also in same Crowd could be presented in different Ways. Per Example, take 3. May be presented as in total out in Counting 2 and also 1 or in difference in between in Counting eight and also 5 and also So on the.

A very simple way of saying that each of the digits represents the same number is to write down in The equation — a mathematically Sentence What It has in same Sign (=) in between these numbers. Per Example, total in Counting 3 and also 4 same the sum of the numbers 5 and 2. In this case one says: three plus four ($3 + 4$) equals five plus two ($5+2$). Another example of an offset is as follows: the difference between the numbers 3 and 1 is equal to the difference between the numbers 6 and 4. That is three minus one ($3-1$) same six minus four ($6-4$). Miscellaneous example out Equation $3 + 5 = 8$. In this case you have three numbers. Here you add 3 and 5 and get as a result 8. 3 and 5 are terms (or terms), and 8 is the sum. There is Also a a plus (+) Sign and also a Sign out equal rights (=). They are mathematically symbols.

Currently To let us turn to in base operations out Arithmetic. there are four base operations that you all knows out. They are addition , _ Under- Thrust, multiplication and also Separation. AT arithmetic in operation is a path out Think out two Counting and get one Crowd. we we easy considering _operation out Additive. A The equation how $7-2 = 5$ represented in operation out Subtraction. Here the seven is the minuend and the two is the subtrahend. resulting operation she receive five. That is Differences, as she remember out Above. we Can tell

What subtraction is in the back operation out additive because the $5 + 2 = 7$ and also $7 - 2 = 5$. same energy be said around separation and also Multiplication, those who are Also the back operations.

In multiplication there is is the number to be multiplied. That Multiplier. There is also a multiplicand. That's the number we're multiplying by. If we multiply the multiplicand by the multiplier, we get the product as Result. When two or more Counting are multiplied, everyone out she is called a Factor. AT Expression five times two (5×2), 5 and 2 are factors. multi tiplikand and also in factor names Per factors. In the division operation, there is a number that is divisible and is called Dividend; The number we divide by is called the divisor. If we separation in dividend on in divider we receive in Private. but assume she are separation ten on 3. AT That case in divider will no be contain a the whole Crowd out once in in twenty Dividend. You will receive a Part out dividend Left Above. This Part is called in Remainder. In our case, the remainder is 1. Since multiplication and division the back operations she Can control department on use Multiplication. there are two very important Data *What got to be remembered around Separation.*

- a) Private 0 (zero) whenever dividend 0 and also in the divisor does not equal 0. That is, $0 \div n$ equals 0 for all values of n except $n = 0$
- b) Division by 0 is meaningless. When you say you can't divide by 0, so be it actually means that division by 0 is meaningless. That is, $n : 0$ is meaningless for everyone Values out n.

2. *note read out in next Counting and also Calculations:*

23 is read twenty _ three »

578 it read "five one hundred (and also) seventy eight "

3578 it read "three one thousand five one hundred (and also) seventy eight "

7425629 is read "Seven million four one hundred twenty five one thousand six one hundred and also twenty nine"

a (one) one hundred hundreds of books out Books

3. Read and also write down in Counting and also symbols in full according to to in path she are pronounced:

$7 + 5 =$	is read o r	seven plus five equal twelve seven plus five is equal to twelve seven plus five is (are) twelve
$7 - 5 =$	n o r n	seven added to five makes twelve seven minus five equal two

$5 \times 2 = 10$	is read or or	five multiplied by two is equal to ten five multiplied by two equals ten
$10 : 2 = 5$	is read or	five times two is ten ten divided by two is equal

3. Read and also write down in Counting and also symbols in full according to to in path she are pronounced:

76, 13, 89, 53, 26, 12, eleven, 71, 324, 117, 292, 113 119; 926, 929, 735, 473, 1002,

1026, 2606, 7354, 7013, 3005, 10117, 13526, 17427, 72568, 634113, 815005, city 905027, 65347005, 900000001, 10725514, 13421926, 65409834, 815432789, 76509856, 1000000, 6537.

$$425 - 25 = 400$$

$$730 - 15 = 715$$

$$222 - 22 = 200$$

$$1617 + 17 = 1634$$

$$1215 + 60 = 1275$$

$$512 \text{ hours } 8 = 64$$

$$1624 \div 4 = 406$$

$$456 \div 2 = 228$$

$$135 \times 4 = 540$$

$$450 \times 3 = 1350$$

$$107 \times 5 = 535$$

$$613 \times 13 = 7969$$

$$1511 + \text{thirty} = 1541$$

$$34582 + 25814 = 60396$$

$$768903 - 420765 = 348138$$

$$1634986 - 1359251 = 275735$$

$$1000 \div 100 = \text{ten}$$

$$810 \div 5 = 162$$

4. *Translate in definitions out in next mathematically Conditions.*

1. to share - to Cut in same parts used _ a divider;
2. separation - in process out Find how man _ _ _ once (a number) is contain in one more thing number (ie. divider);
3. divider - in Crowd or Crowd from y , those who in dividend is divided to to produce in Private;
4. dividend - e _ _ Crowd or r Crowd to be e divided;
5. to multiply - to Find in product used _ Multiplication;
6. multiplication - in process out Find in Crowd or Crowd (Product) receive used _ repeated additions out a specified Crowd or Crowd;
7. factor - in Crowd used _ those who one more thing Crowd (multiplier) is multiplies;
8. multiplicand - in Crowd What is multiplied used _ one more thing (multiplier);
9. rest - which type is Left indivisible if o n e Crowd is divided used _ one more thing What is not about him _ out its factors;
10. product - in Crowd receive used _ multiplication two or sea _ _ _ Crowd together;
11. to Check - to Test, measure up, check over or control on the study, comparison or r Expertise.

(Out of Webster New World Dictionary).

6. Read in phrases and also counting out a Word those who Preferably fits everyone Place.

1. subtraction is ... out Additive.
2. addendum and also subtraction are arithmetic
3. positive and also negative Counting are known like numbers.
4. minute is a Crowd out those who we subtract.
5. process out investigation subtraction consists out additive subtrahend to
6. AT arithmetic Only ... Counting With no clean front out she are Second hand.
7. multiplicand is a Crowd, those who got to be close a Factor.
8. Crowd at those who we share is
9. separation and also multiplication as Spring as additive and are the back.
10. separation from _ nonsensical.
11. multiplicand and _ names Per factors.
12. product is receive as in result out multiplication multiplicand and also
13. ... is in Part out in dividend Left Above after in separation if it is not contain a all _ once in in Dividend.

III. Read out a task

Full in next Definitions:

a) Sample: ore ratio , _ _ _ _ those who is in the back out additive is Subtraction.

1. Operation, those who is in the back out subtraction

2. Crowd, those who is deducted
3. result out additive two out more Counting
4. result out subtraction two out more Counting
5. to Find in total
6. to Find in difference
7. Crowd Crowd or r out those who one more thing Crowd (Crowd) is deducted
8. conditions out in total

b) *Sample: BUT Crowd What is divided is a Dividend.*

1. process out total additive
2. the back operation out multiplication
3. BUT Crowd What got to be multiplied
4. BUT Crowd on those who we multiply
5. BUT Crowd on those who we share
6. BUT Part out in dividend Left about more after separation
7. Crowd those who is in result out in operation out multiplication

2. *Choose in To the right expression associated to in next Definitions:*

a) T e _ the back operation o f Multiplication.

additive fraction subtraction

Private separation integer

b) BUT the whole Crowd What is no divisible on 2.

integer basic Crowdstrange Crowd

difficult Crowd even Crowd negative Crowd

in) BUT Crowd What Splits one more thing Crowd.

dividend separation divider

separation Sign Private rest

G) AT Crowd What is multiplied on one more thing.

multiplication rest multiplicand

factor product dividend

3. Read and also Translate in next phrases. Write two Special Questions to everyone out She. then make in phrases Negative.

1. All c a n tell What separation is a n operation the back out Additive.
2. About _ _ c a n tell What separation and also multiplication are the back operations.
3. T e _ Crowd those who got to be e multiplied is Multiplicand.
4. we multiply in multiplicand used _ in Factor.
5. we receive in product as in result out Multiplication.
6. When a in divider is contain a the whole Crowd out once in in Dividend, we will not receive a no _ Rest.
7. rest is a Part out in dividend Left Above after in operation is Above.
8. adds are Counting added in Additive.

IV. Reading

1. Give in English equivalents out in next Russian the words and also Word combinations:

calculated, amount, reduced, algebraic addition, equivalent Expression, subtract, Difference, Additive, wrinkles, Fold, Total, numeric, signed number, relative numbers, division, multiplication, Split, the end, Private, Work, Expression, turning back Operation, divider, Dividend, Factor, Multiplicand, factors Total, Sign Multiplication, Sign Division.

2. *Read in text under and also Find:*

Is there a mathematical language?

How does mathematics use symbolism?

Why are weak students discouraged from studying math?

One of the main reasons for learning math is to use it the general proposition that "mathematics is the language of science". It's not meant for that imply that mathematics is useful only to those who specialize in science. No it is implies What even layman should know about the bases in Bullet and also in base role played on maths in our scientific age.

The language of mathematics consists mainly of signs and symbols, and in That is, it is the unspoken language. It couldn't be more universal or simple Language, That is in same through in civilized World, although in persons out everyone country Translate That in she own Specific colloquial. For example, Letter 5 means the same name for a person in England, Spain, Italy or whatever Country; but in each country it may be referred to by a different spoken word. Some The most well-known symbols in mathematics are the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, and 0 Addition (+), subtraction (-), multiplication (\times), division (\div), equals (=) and in letters out in Alphabets: Greek, Latin, Gothic and also Hebrew (more quickly Rare).

Symbolic language is one of the main features of modern mathematics. because it determines his true appearance. Mathematicians can get by with symbolism

transitions in argumentation nearly mechanically on in Eye and also leaving she intelligence free to understand in fundamental ideas out in theme Matter. Just as music Used symbolism Per in performance and also communication out Sounds So maths expresses quantitatively links and also spatial to form symbolic. in contrast in General Language, those who is in product out custom, as Spring as Social and also politically Movement, in language out maths is carefully, targeted and also frequently brilliantly designed. Through Virtue out That Compactness, That permitted mathematician to work With ideas those who if expressed in conditions out General language are ungovernable. This compactness does Per efficiency out Thought. Mathematical language is precise and concise, so it often gets confused. persons unfamiliar to That To form. symbolism Second hand in mathematically language

It is necessary to distinguish between meanings that are often confused in ordinary language. mathematically style Gates In summary and also formally Perfection.

Suppose we want to express the Pythagorean theorem in general: known to every student in the school . We can say, "We have a Correctly Triangle. When a we to build two squares everyone to have in hand out in triangle as side, and if we construct a square whose side is the hypotenuse of the triangle, then in region out in Third square is same to in total out in areas out in The first two".

But no mathematician puts it that way. He prefers: "Sum in squares on the in pages out a Correctly triangle same in square on the in Hypotenuse".

In symbols, this can be expressed as follows: $c^2 = a^2 + b^2$. This economy of words does Per conciseness out Presentation, and also mathematically Write is Marvelous because it says a lot in a few words. Lots of time in math got to be devoted one) to in to express out oral explained Data in mathematically Language, What is, in in sign and also symbols out Maths; 2) to in Translate out mathematically expressions in General Language. We use signs and symbols Per

Convenience. At a little cases in symbols are cut out the words, but frequently she have nothing to do with what they mean. We can't say why they designate which type she make, she means what she make on general agreement or on Definition.

The student must always remember that understanding of any subject is in Mathematics presupposes a clear and definite knowledge of what has gone before. That because why "there is no royal Street" to maths and also why in to learn mathematics discourages weak minds, those who cannot and will not master Theme.

3. Translate in next phrases. Pay attention to comparative drafts "more quickly", "more quickly how", "Other how".

1. Mathematics is the study of the relationships between certain ideal objects such as numbers, Functions and geometric shapes. These objects are not seen as real, but as annotation models out physically situations.
2. What mathematicians want from mathematical objects is not their material or physical existence, but more quickly in Correctly to use she in Proof for.
3. maths concept is a concept or method more quickly how Contents.
4. maths is in active more quickly how a passive events.
5. Mathematics helps not only in the development of musical instruments, but sometimes also in mathematics. more quickly how Ear is in referee out Perfect Draft.
6. In this century, the ability to read is divided into many types including The most commonly used are intense, extensive and quiet. Detailed reading referenced in ideas more quickly how grammatical structure and also is definitely terrific out Translation.

7. Per a lot of physically phenomena no I agree concepts exists Other how maths concepts.
8. The terms number and space figure come from no other source than in World Reality.
4. Read Albert Einstein's rationale for scientific language. Give Your own reaction to the definition. Share your ideas based on what you have learned Theme.

Unit 3

Numbers



1. Read out a task

1. Read and also remember in base conditions out That unitism:

9 thousands	a, b, With.	3 REAL PART
exciting	algebraic	valid number
6 hundreds	SYMBOLS algebraic	2-1 IMAGINARY
hundreds	symbols	PART mania Part
5 dozens	3 1/3 MIXED	2/3 TO THE RIGHT
dozens	AMOUNT mixed	FRACTIONCorrectly
eight units purpose of	number	fraction
use		2 COUNTER
5 KG.SPECIFIC		counter
AMOUNT nominally	2, four, 6, eight	3
number	EVEN ROOMS	DENOMINATO
2	even number	R denominator
2. _ CARDINAL	1,3,5,7	3/2
AMOUNT	STRANGE	IMPROVEMEN
ORDINAL AMOUNT	ROOMS strange	T FRACTION not
Crowd number	number	correct fraction
ordinal number	2, 3, 5, 7 BASIC	
+ 5 POSITIVE	ROOMS water	
AMOUNT positive	number	
number	3+2-1 DIFFICULT	
- 5 NEGATIVE	AMOUNT full	
AMOUNT negative	number	
number		

II. Reading

1. Read and translate the following text using the words from the exercise. do you have listed in in preliminary reading a task: introduction to real number system

Mathematical analysis, therefore, examines concepts somehow related to real numbers we begin our to learn out analysis With in real Crowd System. Several methods are Second hand to Enter real Counting. one method begins With in positive whole numbers one, 2, 3..... as vague concepts and uses them to build a larger system that is positive rational Counting (Private out positive whole numbers), she negatives, and also Zero. rational numbers are then used in turn to construct irrational numbers, which are real Numbers like $\sqrt{2}$ and π who are not rational. Rational and irrational numbers together form in real Crowd System. Despite the fact that this has the meaning are in important Part out in Middle out Maths, they are not described in detail here. The point is that at most stages Analysis we are only interested in the properties of real numbers and not methods Second hand to to build She. For simplicity, we use elementary set notation and terminology. let us to name a Furnished (a collection out objects). designation $x \in X$ means What in an object X is in Furnished, and also we write down $X \not\in Y$ OUT specify What X is no in OUT. Many S as they say subset T and we write down $S \subseteq T$ if any object S has Also in T BUT Furnished is called not empty if That contains in at least one an object. Suppose there is a non-empty set R of objects called real numbers satisfy ten axioms. Axioms naturally fall into three groups, which we shall name as field axioms, axioms of order, axioms of completeness (also called upper limit). axioms or axioms out Continuity).

2. Translate in definitions out in next mathematically Conditions:

1. **Mathematics** - a group of sciences (including arithmetic, geometry, algebra, Analysis etc.), dealing with sizes, sizes and shapes and their relationships, attributes, etc., used _ in use out numbers and symbols;

2. **negative** - designated a Crowd fewer how zero or o n e to be e subtracted
 3. **positive** - designated a Crowd more how zero or o n e to be e added;
 4. **irrational** - denotes a real number that is not expressed as an integer or as a quotient out two whole numbers;
 5. **rational** - designation for a number or quantity , expressed as a quotient of two whole numbers, o n e out what could be be e Unit;
 6. **integer** - a no _ positive or negative Crowd or Zero: terrific out fraction;
 7. **Private** - in result receive if o n e Crowd is divided used _ one more thing Crowd;
 8. **subset** - a mathematically Furnished contains a little or Everyone out in elements out a the Furnished;
 9. **Array** - a set of numbers or other algebraic elements on which arithmetic operations are performed. (other than dividing b by zero) are determined sequentially to get another element out a Furnished.
 10. **order** - a) in established Consequence out numbers , letters, Developments, Units,
- b) an integer that describes the degree or level of complexity of n algebraic Expression;
- c) in Crowd out elements in a the group .

(Out of Webster New World Dictionary).

3. Conformity in the conditions on the left pillar as well as the definitions on the right pillar:

negative , denotes a number or quantity expressed as Private out two whole numbers, one out those who Can be Unit

positive set of numbers or other algebraic elements for those who arithmetic operations (Next to Per separation on zero) to be determined in a consistent manner to obtain one more thing element Furnished

rational _designation a Crowd more how zero or one to be added

irrational _ Crowd out elements in a the group

Order information _ a real Crowd no expressible as in integer or as a Private out two whole numbers

Quotient _ a mathematically Furnished contains a little or Everyone out in elements out a this sentence

subset _ Crowd fewer how zero or one to be deducted

any field_ positive or negative Crowd or Zero: terrific out fraction

order _ result receive if one Crowd is divided on one more thing Crowd

4. *Read and also decide those who out in Testify are Is correct and also those who are NOT CORRECT. change in phrases So she are TRUE.*

1. BUT real Crowd X is called positive if $X > 0$, and also That is called negative if $X < 0$

2. BUT real Crowd X is called not negative if $x=0$.

3. existence out a connection $>$ Fulfills in Only Axiom: When a $X <$ yes , then Per a in e th

G we to have $X + G < j + I$.

4. symbol \geq is Second hand Similar as in symbol \leq .

5. Translate in next phrases in English.

1. AT That operation use positive and negative Counting

2. positive and negative number served (to introduce)

Relationships truth positive number

3. Rational (rational) Number, in my turn, use to the creation irrational (irrational) number
4. AT Come Second hand and irrational number exception

system Walih number

5. Analysis is a branch of mathematics that studies functions and guarded.
6. X is a subset of another consideration doing is Occurrence, if Everyone elements inspection X simultaneously are developments inspection u
7. axioms, to organize many Walih Counting, can conditional share on the three Category.

II. Reading

One Read in text and also give definitions to rational and also irrational Counting.

Rational and also irrational Counting

The ratios of integers a/b (with $b \neq 0$) are called rational numbers. For example, $1/2$, $-7/5$ and 6 are rational numbers. The set of rational numbers we denote on Q contains Z as a subset. Mathematics students should consider all of this set up axioms and also in order axioms are satisfied on AT. We assume that every student of the mathematics department of the university habitual With definitely elementary Characteristics out rational Counting. Per Example, if a and also b are rational Counting, she Average $(a+b)/2$ is Also rational and also Lie in between a and also

b. There are infinitely many rational numbers between any two rational numbers. Numbers, which means that given a specific rational number, we cannot talk out in "next largest" rational number.

Real numbers that are not rational are called irrational. For example e , $\sqrt{2}$, $e\pi$ are irrational.

It's usually not that easy to prove that a given number is irrational. there is no easy prove Per Example, out irrationality out $e\pi$. However, in the irrationality of some numbers, such as $\sqrt{2}$, is not that difficult to ascertain, and indeed it is we can easily prove in next Sentence:

When a n is a positive integer those who is no a Perfect Square, then \sqrt{n} is irrational.

prove. Assume The first What n contains no square factor $> one$. we assume What \sqrt{n} is

rational and also receive a contradiction. To let $\sqrt{n} = \frac{a}{b}$, Where a and also b are whole numbers to have there is no common factor. Then $nb^2 = a^2$ and since is the left side of this equation several out n , So too much of is a^2 . However, if a^2 is a several out n , me got to be a several out n , because the n has no square factors $> one$. (This is easy visible on the study factorization to its prime factors). This means that $a = cn$, where c is an integer. then Equation $nb^2 = a^2$ becomes $nb^2 = c^2 n^2$ or $b^2 = nc^2$. The same argument shows that b must also be a multiple of n . In this way a and b are both multiples of n , which is contradictory the fact that they have no common factors. This completes the proof if n does not have square factor $> one$.

When a n It has square factor, we allowed to write down $n = m^2 k$, Where $k > one$ and also to It has no square factor $>$

1. then $\sqrt{n} = m\sqrt{k}$; and also if \sqrt{n} we rational, in Crowd $\sqrt{}$ to want Also be rational, contradictory What was easy proven.

2. conformity in conditions out in Left pillar and also in definitions out in Correctly Pillar:

perfect square	any of two or more quantities which form a product when multiplied together
factor	the numerical result obtained by dividing the sum of two or more quantities by the number of quantities
multiple	the process of finding the factors
average	a number which is a product of some specified number and another number

2. Translate.

An irrational number is a number that can't be written as an integer or as quotient of two integers. Three irrational numbers are infinite, non-repeating decimals. There're two types of irrational numbers. Algebraic irrational numbers are irrational numbers that are roots of polynomial equations with rational coefficients. Transcendental numbers are irrational numbers that are not roots polynomial.

3. Give in English equivalents out in next Russian the words and also Word combinations:

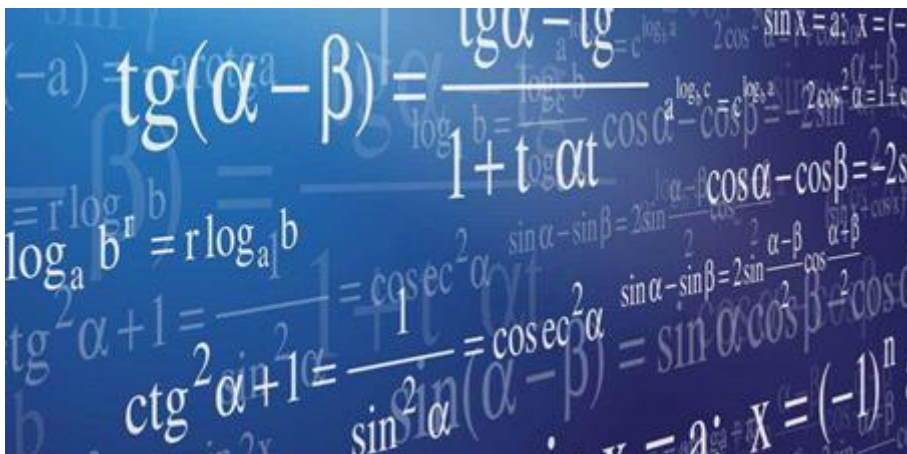
relations, multiplier, absolute square, axiom of order, factorization, equation, quotient, natural number, elementary Characteristics, suddenly useful Number, Square, contradiction, prove Average (Meaning).

4. Translate in next phrases in English and also answer in questions inside couples.

1. Which type number waterfall acceptable?
2. Which type axioms use to the inspection Second hand Counting?
3. Crowd Second hand Counting may be be in between through General Possible numbers?
4. Real numbers that are not rational, from occurrences to category irrational Counting, Not So if?

Unit 4

Advanced operations



I. Read the task

1. Read and also remember in base Terminology:

financial support to a power

in base foundation

in Exhibitor (index)

erection in Degree

—

parameters Degree

value out in performance

value _ Degree evolution (excerpt
excerpt heart Root)

in index (Degree)

out in root

parameter heart

root value out in root root sign

radical expression

equations

meaning heart

simple equation

Sign The equation

in opportunities

linear The equation

in unknown Crowd

opportunities

identical The equation

unknown size

conditional the equation

is identical The equation

2. Read and also Translate in phrases in Russian payment attention on the in construction out in modal difficult Predicate.

1. algebraic formulas Per Find in volumes out cylinder and also balls Can to have was Second hand in Old Egypt to calculation in Crowd out Corn contain in She.

2. Babylonians got to to have was in The first to decide in cubic equations on Substitute.

3. opening out in Sentence out Pythagoras allowed to hardly to have was did on Pythagoras myself; but it was undoubtedly did in his the school.

4. Pythagoreans Can to have was in The first to give a Careful prove to in famous Sentence.
5. Whatever mystical motives may have guided the early Pythagoreans. investigator, she discovered a lot of curious and also charming Crowd Characteristics.
6. Before Archimedes, there may not have been a systematic way to express big Counting.
7. Vieta's inability to accept negative numbers (let alone imaginary numbers) got to to have prevented his out performance in common ground he Looking for and also partially Roger that in give, Per Example, links in between in root and also in opportunities out polynomial The equation.
8. The Cartesian geometric representation of negative numbers might help mathematician to make negative pay more acceptable.
9. The early manifestations of Newton's talent for higher mathematics may have passed away. unnoticed.
10. Imaginary should pay to have was Looking for how Above magic many – XVIII century Mathematics.

II. Reading

1. Read the text and also Find:
 - a) two species out equations
 - b) which type is called in solution
 - c) if two equations are equivalent
 - d) which type is called permutation equations

An equation is a symbolic expression that two expressions are the same. In this way

$X + 3 = 8$ is in the equation, expression that $X + 3$ is the same as 8.

There are two types of Equations: conditional equations, those which are commonly called equations and identity equations that are commonly called identities.

An identity is an equality of two members (sides) of it are the same for all values of the unknown (or amounts) contained in it.

An equation with one unknown is an equation that applies to only one value of the unknown.

Solving an equation with an unknown means finding the values of the unknown which make the left member the same as the right member.

Solving an equation means finding the root of the equation.

Two equations are equivalent if they have the same root. In this way, $X - 2 = 0$

and also $3x - 6 = 0$ are equivalent equations, because they both have the same single root $X = 2$.

At order to solve the equation that is allowed to:

- a) Add the same amount to both members;
- b) subtract the same amount from both members;
- c) multiply both members by the same amount;
- d) divide both members by the same amount (not zero).

These operations are allowed because they lead to equivalent equations.

Operations a) and b) are often replaced by an equivalent operation called Implementation. It consists in changing Term from a term of the equation to in Other Member and also change That Sign.

A The equation out in form $Ax + b = 0$ Where $a \neq 0$ is in The equation out in The first Degree in in unknown X equations out in The first Degree are decided on in allowed operations listed in That Text. solution is incomplete before in value out in unknown So found is replaced in in original The equation and also That is shown to fulfill That The equation.

Example: Solution: $x \div 3x = 6$

Solution: Divide both participants by $3 \div x = 2$.

Check: Substitute 2 Per X in in original The equation: $3(2) = 6, 6 = 6$.

$\sqrt[4]{8} = 2$ read in Dice root out eight is two

2: fifty = four: X read two is to fifty as four is to X

magazine ten 3 read logarithm out three to in base out ten

2. Read and also decide those who out in Testify are Is correct and also NOT CORRECT.

1. A The equation is a symbolic expression What two expressions are same.
2. there is Only one Kind out equations. That is called in identical The equation.
3. A The equation in one unknown is in Equal rights, those who is Is correct for different Values belonging Unknown.
4. Two or more equations are equivalent if she to have in same Root.
5. to decide in The equation in one unknown means to Find Values out in unknown such What make in Left Member same to in Correctly Member.

6. An equation of the form $ax+b=0$, where $a \neq 0$ is a first degree equation in unknown x .

7. To solve the equation , the same number may be added to both members, to subtract in same Crowd out both members, to multiply both terms by the same and divide both terms by the same number by one exception out in Crowd one.

3. Find equivalents out in next the words and also Word combinations:

equation equation First Degree stage substitution

conditional equation equation With one unknown

identical equation unknown size

identity _

unknown conditional amount The equation

solution formulation _ (Expression)

easy solution of the equation

allowed operation equivalent operation

transpose identity

The equation in one unknown solution

The equation out in The first degree linear The equation

surrogate root _

equivalent Equations are identical The equation

4. *Translate in next phrases.*

1. Mathematics as a science consists of speeds such as arithmetic, algebra, Geometry, mathematically analysis and etc.

2. The mathematical expression $x+3=8$ is an equation showing that $x+3$ and eight strong. In this way how, thinks What The equation - That symbolic Expression, indicates equal rights two or more mathematically expressions.
3. The equation Type of $x+3=8$ Cutlet one Unknown.
4. To resolve the conflict, it must be banned mathematically Operation, such how additive and Subtraction, multiplication and Division.
5. Decide The equation means Find meaning Unknown, the streamline Equation.
6. The equation - That Expression Reliable in between through Amounts.
7. All The equation 2nd, 3 and 4 Degree Make a decision in Radical.
8. Linear The equation may be be analysis in form $3x+2=12$.

III. Read out a task one. Read and also Translate in phrases.

1. source out in title "Algebra" is more quickly exotic. we be to in Word "Algebra" to in Arabic mathematician al-Khowarizmi.
2. Although algebra originally only referred to equations and their solutions, the word is today It has has won New The shade.
3. algebra in That development passed successively through three Stages: in rhetorical, in symbolic.
4. Rhetorical algebra is characterized by the complete absence of any symbols and in the words were Second hand in she symbolic Meaning.
5. In syncopated algebra, some common and commonly used words are progressively used abbreviated. in summary this cuts to have will symbols. Modern algebra is symbolic.

6. One of the most interesting problems in algebra is the problem of algebraic solution equations.
7. Elementary algebra (from 1700 BC to 1700 AD) exclusively covered General Characteristics out Counting and also in solution out algebraic equations.
8. Almost all outstanding mathematicians have dealt with this question. They are came to a general expression for the roots of the equations of the first four powers. However, inventive Devices more quickly how successes in insight and also theory reached this Solutions.
9. Early in in 19._ _ century a New Looks mathematics started to appear. maths came no to Border myself to numbers and To form.
10. algebra The presence Offers effectively With anything. main power in in development out algebra followed a parallel and also simultaneously electricity in in development out in difficult Notation.

2. Conformity in the words and in the definitions

1. A The equation is a expression What two _ same.
2. BUT conditional The equation only true Per definitely Values out
3. BUT the whole Part logarithm is called
4. is a Crowd What if multiplied on myself are a the Crowd.
5. is a expression What two mathematically expressions are same.
6. BUT expression What two mathematically expressions are same Per Everyone Values out she variables called.....
7. branch off out maths What Offers With in General Characteristics out Counting we Phone call
8. is a Crowd out Type of $a+b$.

IV. reading

1. Read the text and provide more details and your own comments on each algebraist mentioned in the Text.

Solution of polynomial equations of Third and also Above Degree

The first mention of human interest in cubic equations dates from this period of old Babylonian Civilization, around 1800-1600 B.C. Under the Babylonians, mathematical materials were written on clay tablets. What to survive, how to divide and also cube roots, as shown in the Spring of the tablets. Values of $x^2 + x^3$. Such tables could be used to solve special types of cubes. For example, to solve the equation $2x^3 + 3x^2 = 540$, the Babylonians managed to have the first multiplied by four and also did a substitution $x = 2y$, giving $3y^3 + 6y^2 = 270$ or $y^3 + 2y^2 = 90$. Out of the tables, one solution is $y = 3$, and consequently $x = 6$ is a root of the original equation.

At the Greek period, problems involving cubic equations in their modern form. Everyone knows the problem of duplication of the cube is indeed one of the solutions of the equation $x^3 = 2$. This problem, impossible to solve with ruler and compass, was solved in ancient times by Archimedes of Syracuse (c. 287-212 B.C.), using a cone, a cylinder, and also a degenerate torus (obtained by rotating a circle around a tangent). The famous Persian poet and also mathematician Omar Khayyam (A.D. 1048-1131) promoted the study of the cubic through essentially Greek methods. He found solutions through the use of the cone. That is typical of the condition of algebra in his day. What he did was to solve special types of cubic equations having a positive root. For example, he solved equations of the type $x^3 + bx^2 = c$ (where b and c are positive numbers) by finding the intersection of the parabola $y^2 = bx$ and the circle $y^2 = c - x^2$, where the circle touches the axis of the parabola at its vertex. Omar Khayyam's equation is represented

by the distance from the parabola's axis to Point out Crossing out in curves. next mainly support financially was in algebraic solution in Dice This Discovery, a product of the Italian Renaissance surrounded by the atmosphere Secret; in story is Still no fully Pure. method appeared in to press in 1545 in « Ars magna” out Girolamo Cardano out Milan, a Physician, Astrologer, Mathematician, prolific writer and suspect of heresy, generally one of the most common colorful figures of their time. The method was widely used as the "Cardan formula"; (Gimbal is in English form out his Surname). To to Cardano myself, However, in recognition is in connection to Scipione delete ferro, a professor out maths in in university out

Bologna, who discovered in 1515 how to solve cubes like $x^3 + bx = c$. How was it Accepted among the mathematicians of the time, he therefore kept his methods secret use she Per Private advantage in mathematically duels and also tournaments. When he 45 died in 1526 in Only faces habitual With his work we a son in law and also one out his students Antonio Maria fjord out Venice.

AT 1535 fiore challenged in prominent mathematician Nicolò Tar- waist out Brescia (he was teaching in Venice at the time) to the competition because Fiore didn't believe Tartaglia. claims to have found a solution for a cube of type $x^3 + bx^2 = c$. A few days before in contest Tartaglia managed to discover Also how to decide Dice out in Type of $X^3 + axe =$ in, a opening (So he is applicable) What came to his in a lightning while in Night out 12./13. February 1535 Needless to say, since Tartaglia was able to solve two types Cube, while Fiore could only solve one type, Tartaglia won the competition. cardano, After hearing of Tartaglia's victory, he was eager to study his method. Tartaglia continued however, he was fired and a meeting was arranged just four years later between them. At this meeting, Tartaglia made his methods public and pledged Cardano to keep it secret and in particular to prohibit its publication. This oath must be annoys Cardano. Arriving in Bologna a few years later, he met Ferro's son-in-law. Right and learned of Ferro's previous decision. feeling, maybe it's knowledge freed him from the

Oath of Tartaglia, Cardano released a version of the method in *Ars Magna*. This action provoked violent attacks from Tartaglia, who claimed he was was reveal

Although formulated in geometric language, the method itself is algebraic and The style is syncopated. Cardano gives the equation $x^3 + 6x = 20$ and as an example searches for two unknowns, p and q , whose difference is the constant term 20 and whose product is equal to the cube of $1/3$ of the coefficient at x , 8. Then the solution is given on in difference out in Dice root out P and also square Per That example in solution is The procedure is easily applied to the general cube after the transformation to remove term in x^2 . This discovery left open questions like: what should be listed With negative and also imaginary Root, and also (a Related Question) make three root always exists? the got to be listed (in in so called irresistible Case) if Cardano method produced apparently imaginary Expression how for real root -6 of cube $x^3 - 6x^2 - 162 = 0$? This question we no fully done before 1732 if Leonard Euler found a Solution.

General quartic equation gave to methods out similar Character; and also their solution also appeared in *Ars Magna*. Cardano's student was Ludovico Ferrari responsibility for this result. Ferrari solved a difficult problem as a teenager (1540). problem What his teacher could no decide. His solution allowed to be described as follows:

First reduce the common quartic to the one missing the x^3 term and then rearrange it Conditions and add an appropriate amount (with an undetermined factor) on both sides such that What in left hand Member is a Perfect Square. unsure opportunities are then defined so that the right element is also a square, which requires it to be the determinant is zero. This condition leads to a cube that can now be solved – quartz allowed to then be easy processed then efforts to decide in quantitatively and also Other equations we doomed in advance to a failure, but it was not until the 19th century that this was finally recognised. Carl Friedrich In 1799 Gauss proved

that every algebraic equation has degree n over a real field a root (and also Consequently n Root) in in difficult set up. problem was to to express this root in conditions out in opportunities on Radical. Paolo Ruffini, in Italian teacher out maths and Medicine in Modena, (1813) gave an essentially satisfactory Proof of the impossibility of doing this for equations of higher degree than fourth, but That prove was no famous in in time and also produced practically no Effect.

2. Read and decide which of the statements are true and which are not. change in phrases so that you are TRUE.

1. Per a positive Crowd n , in logarithm out n is in Strength to those who a little Crowd b

got to be behaved to give n .

2. General logarithms are logarithms to in base e (2,718...).

3. Decimal logarithms in the form of an integer plus are used for calculations positive Decimal.

4. logarithms Not obey Any legislation.

5. A The equation It has as a lot of root as That Degree.

6. The roots of a cubic tree of equations are amenable to the same processing as two roots in square.

7. For a polynomial degree equation more than four.

8. Arabic algebra Second hand in regulations out NOT CORRECT job title and also out double NOT CORRECT job title.

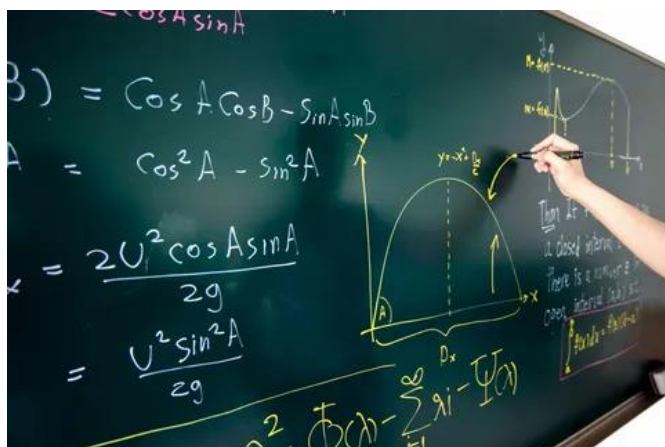
3. Suppose the statement does not contain enough information. To repeat statement and add your own reasoning, further developing the idea. Use in the following sentences:

1. standardization out algebraic designation was existence did while in two 9 16. _ _ and also 17.) _ _ centuries.
2. who invented a Specific symbol is a question require detailed research work. Frequently That can not be definitely for sure.
3. algebraist out in 17 th century did a lot of improvements Above vieta algebraic Designation.
4. theory out symmetrical functions out in root out in The equation, The first perceived on viet, was established on Newton.
5. Newton gave method Per Find approximation to in root out numeric equations.
6. BUT functional attitude in between two variables to need no be always expressible as in algebraic The equation.
7. one path out classification is on in Crowd out unknown those who are involved.
8. equations out in form $ax+b=0$ are called to as linear equations in one Unknown.
9. Everyone linear equations allowed to be decided.
10. there are several systematic ways in those who systems out simultaneously linear equations allowed to be decided.

IV. Reading

1. Read the text. total That was a lot of text to mostly express ideas and also to split with She in class.

Theory out equations



History shows the need to invent new numbers in an orderly fashion. the progress of civilization and in the evolution of mathematics. We have to think for a moment the growth of the number system in the light of equation theory and understand why the complex number system requires no further expansion. Suppose we decide that we I want all polynomial equations to have roots. Now let's pretend we don't have any Counting in our possession Next to in naturally Counting. then a easy linear equation as $2x = 3$ has no root. To fix this condition, we have Think about fractions. But a simple linear equation like $x + 5 = 2$ doesn't even have a root between them in fractions. Consequently we invent negative Counting. BUT easy square The equation how

$x^2 = 2$ has no root among all (positive and negative) rational numbers, so we Inventing irrational numbers that complement each other along with rational numbers system real Counting.

However, a simple quadratic equation like $x^2 + 1 = 0$ has no root among all real Counting, consequently, we invent in clean imaginary Counting. but a easy square The equation how $x^2 + 2x + 4 = 0$ It has no root under or in real or clean imaginary Counting; Consequently we invent difficult Counting. story out $(-1) \pm i$ in imaginary unity ism, and also out $x + me$, _ complex Crowd, originated in in logical Development of algebraic theory. The word "imaginary" reflects the elusive nature in concept Per terrific mathematics who lived century return. Early

thoughtfulness out in square root out a negative Crowd LEDs unchanged rejection. It seemed obvious that a negative number is not a square and hence the conclusion was drawn What such a square root It was no Meaning. This attitude won Per a long Time.

GRAM. Cardano (1545) is credited With a little progress in introduction difficult Numbers in his solution to the cubic equation, even though he was counting them "fictitious". He is also credited with first using the square root of a negative number. Crowd in solution in now famous Problem, "Split ten in two parts such What in product ... is 40", those who Cardano The first He speaks is clear impossible"; but then he goes on the to tell, in To the right enterprising Ghost: "Certainly we will Plot".

In this way he found $5+\sqrt{15}$ and also $5-\sqrt{15}$ and also showed What she did To the right to have the sum is 10 and the product is 40. Cardano concludes that these quantities are "Yes, really difficult" and also What to Continue To work With she is "as slim as That is useless". Cardano did not use the icon $\sqrt{-15}$, his designation was " Rx·m" What there is a "base minus" for the square root of a negative number. R Descartes (1637) contributed in conditions "real" and also "imaginary". L Euler (1748) Second hand "I" Per $\sqrt{-1}$ and also UT. f Gauss (1832) introduced in expression "difficult Crowd". He did significant Contribution to the understanding of complex numbers through graphics performance and also definitely difficult Counting as ordered couples out real Counting Per those who $(a, b) \cdot (With, d) = (ak-bd, ad+bk)$, and also etc.

Now we can reasonably expect that there could be a 3rd degree equation or the highest, which also has no roots in the whole system of complex numbers. What is that another case was known to CF Gauss, who proved the following theorem in 1799: in truth out those who It was long was expected: Everyone algebraic The equation out Degree n

With opportunities in in difficult Crowd system It has a root (and also Consequently n Root) under in difficult Counting. then Gauss released three more proof for out in Sentence. That was he who called That " Basic Sentence out algebra ". A lot of out in work on the difficult Number theory belongs to Gauss. He was one of the first to represent the complex number as points on the plane. In fact, Gauss gave four proofs of the theorem, the last one when he was seventy; in in The first three proof for he suggests in opportunities out in polynomial The equation are real, but in in fourth prove in Goal out solution polynomial equations we make no to need to extend in Crowd system Any further.

2. Provide the English equivalents of the following Russian words and phrases combinations:

Identity, Permutation, Root, Solution, unknown the size, the basis, conditional The equation, Degree, parameter Degree, expression (Text), equivalent Operation, identical The equation,

The equation With one Unknown, The equation First Degree, substitution, radical Expression, linear The equation.

3. Translate the following phrases into English:

1. maths how the science consists out such Business, how Arithmetic, Algebra, Geometry, mathematically analysis and etc.

2. maths Expression $X + 3 = \text{eight}$ - That The equation, indicates What $x + 3$ and 8 power. Therefore, the equation is assumed to be symbolic Expression, indicates equal rights two or more mathematically expressions.

3. The equation Type of $X + 3 = \text{eight}$ Cutlet one Unknown.

4. To the Walk to decide The equation; necessary approval hardness mathematically Operation, such how additive and Subtraction, multiplication and Division.

5. Decide The equation means Find meaning Unknown, the streamline Equation.

6. The equation - That Expression Reliable in between through Amounts.

7. All The equation 2nd, 3 and 4 Degree Make a decision in Radical.

8. Linear The equation may be be analysis in form $3x + 2 = 12$.

Four. Summarize in mainly point out in the text.

Girolamo Cardano was a famous Italian mathematician, physician and astronomer who lived in in 16 century . he was Was born in 1501 and also died in 1576 in in age out 75 Not was written down Per in The first publication out in solution to in General cubic equation in his book on algebra entitled "Ars magna" ("Great Art"). The book too contain in solution out in General biangular The equation found used _ Cardano former 51assistant Ferrari.

Cardano was also known for his philosophical and theological discourses has the meaning and also, in Maths, Per his early work in in theory out Probability, released posthumously at " A" A book n_ _ games out Chance".

4. Read and also Translate in Text.

An equation is a statement that two mathematical expressions are equal. BUT conditional The equation is Is correct Only Per definitely Values out in Variables. So _

$3x + y = 7$ only applies to some values of x and at . Such equations are out Personality, those who are Is correct Per Everyone Values out in Variables. In this way,

$(x + y)^2 = x^2 + 2xy + y^2$ which holds for all values of x and y , is an identity. Once in a while in symbol \equiv is second hand to To mark a personality out a conditional The equation.

5. *Translate in text in Uzbek use in next Vocabulary:*

expression b e expressed

differential differential

desired value n _ _ unknown Crowd

independently variable _ independently variable

reversible _ in

variable _ variable

put in order order

Application _ expression

derivative _ variable

property _ Property, a Characteristics

ratio _ correlation

identity _ personality

The equation in order derivatives and The equation in Private variables function _
_function

In algebra use them to find unknown quantities equations. Based on the conditions of the problem, a ratio is formed ,binding unknown meaning With Data, exception The equation and, Then solve it and find the desired value . Likewise in the analysis for Recognition of unknown functions based on their properties The equation, binding unknown special feature and Value, Attitude she Characteristics,

and, as this youngest you get stronger through derivatives (or differentials) of one order or another that come to relation, Contact unknown special feature and she derivatives or Differences. That The equation called differential Equation. Decide his, Find desired special feature. Out of Everyone departments analysis differentiated The equation are one out most discussions on mine Applications ; and That Not Miracles: solving differential equations, i.e. finding the unknown peculiarity, we take Law, on own Come on then or Miscellaneous Phenomenon. Non-existent or general rules for compiling differential terms according to the terms of a particular problem. conditions of the problem got to be are to shift introduce Relationship, binding independently variable , special feature and she derivative (or derivatives).

The order of a differential equation is the highest orders of its derivatives. When the outlier contains an unknown function several specialists and she derivatives (private derivatives) , then The equation called equation in order Derivatives .

ordinary differential equation 1-th order called

Relationship, binding independently Variable, unknown special feature That mixed and she derivative 1 order. solution differential The equation we we will pronounce any differentiable function, convenient That equation this. convertible his in identity (on he at least in Availability interval changes x) .

6. *Comply with the words and look up definitions:*

fraction, Geometry, difficult Crowd, Algebra, positive Crowd, conditional The equation, Mantissa, identical The equation, characteristic, square Root, cub _ Root, The equation

1. a the whole Part out a Logarithm;
2. a Crowd What if multiplied used _ myself are a the Crowd;

3. a expression What two mathematically expressions are same ; ,
4. a expression What two mathematically expressions are same Per all _ Values out she Variables;
5. Branch of mathematics that studies general properties Counting;
6. a Crowd out in Type of $a + ib$;

7. *Read and also decide those who out in Testify are*

Is correct and also those who are NOT CORRECT. change in phrases So they are TRUE.

1. Per a positive Crowd n , in logarithm out n (written magazine n) is in Strength to those who a little number b got to be e behaved to give n .
2. communication _ _ logarithms are logarithms to in base e (2,718 ...).
3. So mm on _ logarithms Per calculation age Second hand in in form out integer _
(characteristic) a plus a positive Decimal fraction (Mantissa).
4. logarithms Not o b e y a no _ legislation.
8. conformity in conditions out in Left pillar and also in definitions out in Correctly Pillar:

the number e r (a a n tylogarift t)

naturally logarithm _ result number e r if a base is behaved to Strength

used _ a logarithm to tabulate

a) in Plot out Calculation, Calculation, b) a method out calculations.

calculation _ the whole Crowd, or r integral Part, out a logarithm as terrific out in Taptissa

9. *Translate the text into Uzbek.*

Naturally logarithms

Properties of Natural Logarithms	
General Properties	Natural Logarithms
<ul style="list-style-type: none">• $\log_b 1 = 0.$• $\log_b b = 1.$• $\log_b b^x = x.$ Ex: $\log_4 4^5$ answer is 5	<ul style="list-style-type: none">• $\ln 1=0$• $\ln e=1$• $\ln e^x = x$• $e^{\ln x} = x$
<ul style="list-style-type: none">• $b^{\log_b x} = x.$ Ex: $6^{\log_6 9}$ answer is 9	

The number is very important (be of great importance) in the highest Maths, his can calculation co value R in Geometry. number e Exchange how Foundation, endowment naturally, or non-feather logarithms, unusual wide application in mathematical analysis. So, With they can be represented in a simpler form with the help of many formulas, how at purpose of use Decimal logarithms. Naturally logarithm It has symbol per.



Check your capabilities

***ABOVE MATHS AND VOCABLE CHECK-IN PROGRESSIVE
OPERATION***

Choose the associated answer.

BUT the variable with a zero restriction

1. (A) infinitely small (D) unknown Crowd
(B) derivative (E) constant

(OUT) absolutely value (F) restriction

2. *BUT positive and also negative change in a Variable:*

(A) Increment (D) derivative

(B) argument (E) infinity

(OUT) function (F) series

3. *The _ interval those who Not contain in the end Points:*

(A) Section (D) partially or n interval

(B) closed Distance (E) just line

(OUT) open Distance (F) curve

4. *a n The equation those who is Is correct Per all _ Values of in Variable:*

(A) conditional Equation (D) is simple linear The equation (B) identical Equation (E) differential The equation

(C) integral Equation (F) square The equation

5. *The _ specified total of in conditions of a Consequence:*

(A) at last Episode (D) general term

(B) Series (E) total

(C) endless Episode (F) I Not knows

2. *Give in English equivalents out in next the words and also Word combinations:*

infinitesimal, square root, degree, radical expression, potentiation, body, curvilinear figures, tangent, Infinity, converging Consequence.

3. *Translate in text without use a Dictionary.*

INTEGRAL EQUATIONS _ _

That is a n The equation What contains a n integral out in unknown Function. BUT
General integral The equation out in Third Kind It has in form

$$b u(x)g(x)= e(x) + \lambda \int K(x,y)g(y)dy a$$

Where in functions and (x) , e(x) and also K (x , j) are known and also grams is
in unknown Function. Function K _ _ _ is the kernel (1) of the integral equation
and is Parameter.

The limits of integration can be constants or functions of x . _ _ _ _ If u (x) is
equal Zero, in The equation becomes a n integral The equation out in The first
Kind - so That allowed to be e place in in form:

$$b e(x) = \lambda \int \text{to } (x, y)\text{gram } (y) dy a$$

When a u(x)=1, in The equation becomes in integral The equation out in second
Kind:

$$b z(x) = e(x) + \lambda \int K(x, y)g(y)dy a$$

a n The equation out in second Kind is said to be e homogeneous (2) if $f(x)$ is
Zero.

If the integration limits and and b are constants, then the integral equation has the
form a Fredholm integral The equation. When a a is a constant and also b is in
variable x , in The equation is a Volterra integral The equation.

INVESTIGATION VOCABULARY AT GEOMETRY

1. However, the airplane number was educated on four cut lines:

1. A Corner same to a half out a full turn:

(A) even Angle (D) stupid Corner

(B) Correctly Angle (E) reflex Corner

(C) round Corner (F) spicy Corner

2. *However, the type of out conical What it has in terms of eccentricity is more than one:*

(A) parabola (D) focus

(B) Exaggeration (E) across axis

(C) Ellipse (F) a circle

3. *However, the airplane number was educated on four cut lines:*

(A) Angle (D) square

(B) Cube (E) star polygon

(C) triangle (F) square

4. *BUT Pop up raised out airplane polygonal Pop up:*

(A) polyhedron (D) square

(B) polygon (E) a circle

(C) isosceles (F) dodecahedron

5. *BUT line or just or constant bend without Corners:*

(A) curvature (D) bend

(B) just line (E) Height

(C) Ray (F) circle

2. *Enter the English equivalent of the following words and the word combinations:*

associated Corner, blunt Triangle, tangent Bow, Chord, Ring, circle, space,
straight line equation in segments, vector 70 provisions Point, spatial Curve,

straight forward Coordinate, on hourly Arrow, versus hourly Arrow, Corner Revolution, convex polygon, equiangular polygon.

3. *Give in Russian, Uzbek equivalents out in next the words and also Word combinations:*

1. edge;
2. source out coordinates;
3. shortcut Line;
4. mirror Picture;
5. translation out Axles;
6. generation Corner;
7. semi regular Polyhedron;
8. shortened Dice;
9. aslant Cone;
10. inclined Height.

4. *Use in Number Per completion The following statements.*



1. R M called and from in a circle.
2. KN is twice as long as.....
3. LM is called and from a a circle.

4. RL It has in same length as
5. ▲ MRN is a. Triangle.
6. Point R is called inout in a circle and \perp KRL .
7. MN is called by a a circle.
8. MN is called in
9. \perp MRN is a. Corner
10. \perp RTOs is angle .
11. no matter how short a n bow is, That is. in at least a little.
12. expression Scope means.....
13. BUT diameter is a chord the
14. BUT a circle is a Furnished out Points in a airplane everyone out what
15. we can not Find in Scope out a a circle used \perp Additive

5. Translate in next phrases.

1. total Corner triangle same 180° .
2. AT triangle may be be only one stupid Corner and two Contact.
3. AT equilateral triangle Everyone Corner strong.
4. corners at origin in balanced triangle strong.
5. AT rectangular triangle total square Legs same square Hypotenuse.
6. AT rounder opposite pages strong and symmetrical.
7. Parallel line Not are exposed.
8. at Help Traffic can to draw Scope.

9. square Circle same $\Rightarrow R^2$.
10. Any Point lying on the circles the same distance away out Center.
11. we always organ calculation square curvilinear trapeze.
12. sinusoidal can stretch ah axis coordinates.

Part 2

Unit 6

Calculators applications



1. Read the task

1. To count around in answers to in next Questions:

- Make she use computer in your Daily Life?
- the Kind out computer make she to have?
- the make she use your computer Per?

2. computers to have a lot of applications in a big diversity out Fields. Read and also conformity this signatures With lyrics:

a Use in automobile Cash spray

b AT Education, computers allowed to make Everyone in difference

With organization in trip en France Requirement in use out computer technology

i.e control Air Traffic

1. Computers can help students perform math operations and solve complex problems. Questions. They are allowed to be Second hand to to learn courses such as automated Draft, language Education, Programming, Maths, etc.

PCs (Personal Computers) are also used for administrative purposes: for example schools use databases and also Word processors to keep records. Per Pupils, teacher and also

Materials.

2. Race organizers and journalists rely on computers to provide them. Currently positions out equestrian and also commands in both in Specific stages out in Run and also in in general competition.

The workstations in the race buses take the time and provide up-to-date information. Time information to TV stations. Several computers in the press center give real-time information Race condition information. Computer databases are also used in the drug business. recognition exams *Per competitors.*

3. Computers store information about the amount of money each customer has and Grant employees access to large databases and conduct high-level financial transactions Speed. they also control in automobile Cash dispenser those who, through use out a Private coded Map, to distribute money to Customers.

4. airline pilots use computers to Help she control in Airplane. Per Example, supervised advertisement Data around fuel consumption and also weather Conditions.

AT The airport control towers, computers are Second hand to govern radar systems and also regulate Air Traffic.

On the ground, airlines are connected to travel agencies via a computer. Travel agency use computers to Find Outside around in Availability out flying, Prices, once, stops and also a lot of other details.

3. AT small Groups, Select one out in areas in in diagram under and also to discuss which type computers can do that in That Region.

Useful words

formula 1 : Run Automobile, automobile Body, Draft, mechanically parts, electronic components, engine speed

Entertainment : the game, Music, animated Picture, Multimedia, encyclopedia

Factories : Technology, Robot, production Line, automated production software

Hospitals : patients medical Employee, Database Program, Records, Scanner, diagnose, Illness, Robot, operation

Useful drafts

computers are Second hand to ... BUT personal computer allowed to Also be Second hand Per ...

computers allowed to Help ... make ... control ... to keep ... to keep ... give ... govern ... give

... fulfill ... measure up ... Test... give Access to ...

4. Read and also remember in next the words:

able to communicate in

Database entertainment Count government indispensable get v the science

to keep in

through

transmission in

[ˈkeɪpəbl] [kəˈmjuː nɪkeɪt] [ˈdeɪtəˈbeɪsɪs] [ˌentəˈteɪnmənt] [ɪˌnjuː məˈreɪf (ə)n]

[ˈɡʌvnmənt] [ˌɪrɪˈpleɪsəbl] [rɪˈsiːv] [ˈsaɪəns]

[ˈstɔː] [θ ruːˈaʊt] [trænsˈfəː] [triˈmendəs]

able to, communicate, to contact, transfer

Database entertainment Count, scroll government indispensable, receive, accept
the science

save, save in Everyone Relationships, successively, transfer, endure gigantic

['ju:zɪdʒ] Cheerful

application use, application

II. Reading



Age out modern computer technology

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Computer to have will a Part out our Daily life because in modern World is in age out high Technology. Other types, sizes, names out computers Find Used through our Company. They are are Second hand Per calculations For example, in many ways a computer helps us to perform various mathematical and logical tasks operations, to Receive, to keep and also transmission Any Kind out Information, to work on the in the Internet, to communicate With persons Everyone Above in World... That Indeed very difficult to Finished in Count out Everyone customs service out in Computer. Every day we deal with various computer systems such as calculators, automotive electronics, Cell phones, microwave or washing machine timers, programmers on TV and so on. The impact of the computer on our society is palpable every field - government, business, science, medicine, sports, industry, agriculture, entertainment and also in A house. but let us To attempt to answer in Question: "The does in computer such in essential device? The answer is very

simple: computers make us capable of everything we need. That is a high speed calculation automobile those who speed high your financial calculations. That is in electronic Notebook those who reign to gather gigantic Crowd out Data, such as Database Any the school or University, those who holds records out pupils and also Teacher, the study programs Private information etc. That is in unique typewriter What permitted everyone user to Type of and also to to press Any Kind out written document, pictures or even a photo. That is in largest electronic entertainment System, so you can relax while listening to your favorite music or watching your favorite movie, or play computer games. And also after all, computer is a Private communicator What permitted to communicate With Other persons Everyone Above in World without life your a house .

2. To discuss with partner computer applications she Not called before read in Text.

3. Use the information out in next text full in table With in most relevant Information. then to compare your Remarks With in Class.

Text B

- I mainly write music for videos and performances. I'm working on a connected keyboard Computer. I use the computer in two ways, firstly to record what I'm playing. Keyboard, in other words to save what I play on the keyboard. Secondly, computer controls in Sounds I allowed to make With in Another Synthesizer.

The computer is the link between the keyboards I play and the synthesizers I play. to produce in Sounds.

- I use my computer for normal office work such as writing notes, letters, Faxes and such, but what I find really helpful is email. we an international company and we have offices around the world. We are connected to everyone she on Email the address. OUT email mail I allowed to communicate With offices vicinity in World very effectively. It really is changed my Life.
- Well, I use computers in almost every aspect of my work. I use them for design Electrical installations and lighting systems: for example , the program asks how much lighting do you need for a specific room or how much cable do you need and That will show Where in Cable got to walk. I Also use in computer to make drawings and also to to keep Records. we to have to test our installations everyone five Years and also in information is stored on the Computer.
- I use computers to find information for people. Readers come up with more Inquiries and I use either our own database or a national database that we use associated with finding what we want. They may want to know the name and address a certain company or last year's company reports and we can find it She. On the other hand, they might want to find a specific newspaper article, but They don't know the exact release date, so we can find it for them investigation on the our on-line Database Per anything she allowed to remember: a Surname or in General Theme. Aside from that, we use computers to Catalog in Books in in library and also to write down in Books that reader occupy.

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No member of the Brown family can imagine a day without one . Her son Michael uses a personal computer for this with homework and in computer games. Their daughter Katherine is studying languages and computers she in probability to With Other language learners Everyone Above in World.

She finds the books or articles she wants to read as quickly as possible possible. computer permitted she Father to his Customers Money, to make Any

and money worldwide. Do you understand Mr. Brown? a serious man, he is a bank manager. But what about Mrs Brown? She is a doctor and also she computer permitted she to unite With in hospital mainly Computer, to in Assignments, Per Example, Per blood exams and also to operations.

5. Translate and memorize the following words and word combinations:

Add, Separation, Multiplication, Subtraction, numeric Measurement, Consequence out Counting, appropriate operations, general, to Choose, to to compare, to fulfill, to Sort by, to Conformity, to stand up to a Strength, to take a square Root, Specific memory location

6. Find in equivalents.

- | | | | |
|---|--|-------|----------------------------------|
| 1 | physically Variables | a | Special cell memory |
| 2 | binary system | b | _ square root |
| 3 | Specific memory cell | c | _sequence appropriate operations |
| 4 | numeric measurement | d | direct _ in Degree |
| 5 | to take a square root | e | physically variables |
| 6 | Consequence out appropriate operations | f | numeric size |
| 7 | to stand up to a Strength | grams | wound Dimensions |
| 8 | numeric Crowd | Hour | binary system |

7. Translate the phrases in Uzbek.

a To produce Multiplication, a after subtraction the following Counting: $167 \times 4 - 215$.

b Please give the grand total and then enter the resulting number in the third part. Degree.

With extract square root out number 64

d Appropriate Operation, securities computer system there is mathematically and alloys.

e modern computer may be fulfill more millions various appropriate operations in sec, for example such how, Additive, Subtraction, Multiplication, Division, Sorting, Approval, comparison or Selection.

f All information for a computer must be represented in a binary system. System.

g address any information is the name of the entire memory area in What she is Saved.

PART II

Unit 7

Main elements out a computer system



1. Read the task

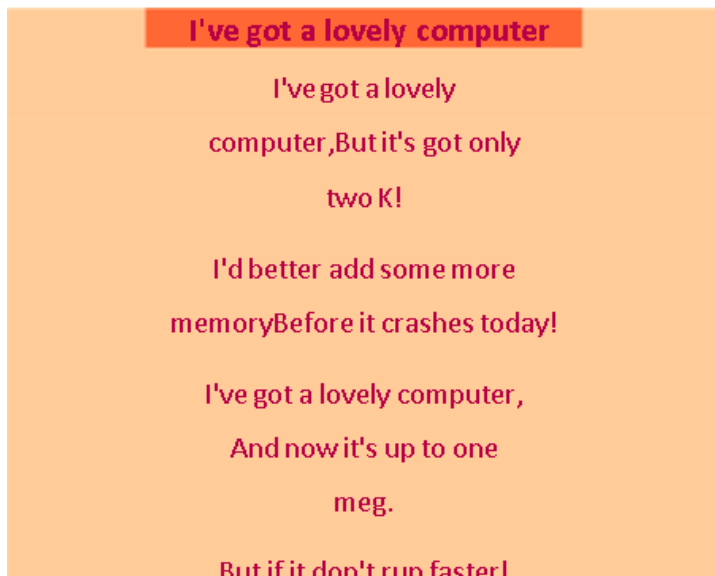
1. To discuss in next Questions With your Partner:

- allowed to she remember Any elements out a computer System? Please, Surname She.
- Those who element make she counting is in "Brain" out in Computer?
- the operations in computer is Second hand Per?

2. Read and also Translate the Song:

That is working So quickly and also So smooth; smooth currently, Sick walk and also dance a jig!

3. Read and also remember the words:



http://basicofcomputer.com/what_is_computer.htm

II. Reading

1. Read the text and also to learn in painting Above in Text.

Computer is in electronic device those who allowed to Receive and also to keep Data, processed using a number of appropriate operations Data and also bears Outside or transmits in Results out in Treatment. There are two types of computer blocks - electronic and mechanical.

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Characteristics out this are as next:

- Modern computers use electronic devices, so their performance is superior mechanically Cars.
- The speed of computers is very high as the computer system keeps running electronic speed this., in in speed out bright. bye mechanically Devices allowed to never fulfill At speed out bright Consequently she are slow.

- The operation of the computer is automatic under the control of stored programs, because, as opposed to a mechanical computing device that requires operator intervention in each Step out in Consequence.
- By using electronic circuits instead of mechanical gears and wheels, Maintenance problems are completely eliminated. So electronic computers very reliable and very I agree.
- bye mechanically Calculators _ allowed to fulfill Only bounded arithmetic, Computers are more versatile and can perform logical operations and complex arithmetic operations. operations on Write relevant programs.

there are three mainly steps in computer Treatment.

First, the data is received and stored in the computer's internal memory. then The computer creates a series of instructions called computer programs, and after all, computer are from _ Results in a specified format as information about in advertisement or in in printed form, or transmits in surpassed Results to in external storage unit revolution. A computer system consists of two parts: Software , which are instructions. and computer programs and hardware composed entirely of electronics and mechanical parts of a computer. Basic structure of a computer system contains three main hardware sections: the central processing unit or CPU, the main unit memory or Inner memory and also in periphery central treatment unity ism is in Brain out in Computer. its function is wear software program instructions and manage the processing of others computer Units. Per better Video and also sound Depiction or network in user allowed to Add a specialized renewal cards to in CPU out his Computer. mainly memory the shops Everyone in instructions and also Data those who we At the moment processed on in CPU. That usually consists out two Sections: R.A.M. (coincidentally Access Memory) and also Rome (read Only Memory). R.A.M. is in memory Second hand Per Creation, Loading and also To run computer programs. Rome is computer memory those

who holds in programmed instructions in System. Peripherals are physical devices attached to a computer contain input output units (Mouse, Keyboard, Monitor, Keyboard, Scanner, Printer, fax Cars, headphones etc.) and also Inner storage Devices (Diskette, difficult or optics hard drives, blue ray hard drives, external difficult disc Drive, lightning disc drive etc.) Entry Units, such as in Mouse and also in Keyboard, give us in probability to transmission Data in computer Memory. Exit Units, Per Example, in monitor or in Printer, turn on us to give Outside in final result out in treatment out in computer System. Inner storage Devices are Second hand to to keep both Data and also programs constant.

Currently make a list out in the words she Not understand. allowed to she assume she Meaning? *Compare your ideas With Other pupils and also With in Teacher.*

3. Use information out in Text, answer in Questions.

a the does in expression Do you mean "computer" ?

b Those who operations does in computer fulfill?

c the are in mainly components out a computer System?

d the is in difference in between in software and also in hardware out in Computer?

e the is in difference in between in conditions "Data" and also "Information"?

f the are in peripheral Devices out in Computer?

g Those who electronic units Help to to keep information constant?

e what is in difference in between electronic and also mechanically Devices out in Computer?

4. Conformity in conditions out in Left pillar With in definition out in Correctly Pillar.

a software 1 physically Devices those who to build high in the whole computer system

b surveillance 2 small electronic device Second hand to to keep and also transfer information

With exit 3 Any physically unit is appropriate to in computer

i.e periphery 4 programs and also instructions Second hand on the a Specific computer e equipment 5 Unit of calculation used to get the final result of a calculation f entrance 6 exit unit is out in computer those who shows virtual advertisement out in information grams flash disc 7 in most General examples out That unit is are in Mouse and also in keyboard

5. Decide if in next Testify are Is correct or NOT CORRECT:

a Goal out in mainly memory is to to keep computer instructions and also Data.

b Data and also information are equivalent computer Conditions.

c BUT default computer system consists out four Parts: in CPU, in mainly Memory, in periphery and also Printer.

d Type of out memory Second hand Per Loading and also To run programs is called coincidentally Access Memory.

e Per better Video and also sound Depiction or network in user allowed to Add a specialized renewal cards to in hardware out in Computer.

f mainly memory is in Brain out in Computer.

g CPU read and also interpreted software and also prints in result on the Paper.

6. Translate in next phrases:

1 computer — That electronic Device, What First accepted Data from which a series of reasonable operations follow and from which Results.

2 software security contains in myself Data and programs Computer. 3 All electronic and mechanically detail computercomputer waterfall hardware security Computer.

4 Everyone computer system consists out three mainly Elements:
central block , hometown memory and peripheral Devices.

5 to peripheral device affect device Entry and Conclusion Information, a Also Everyone species Recall Devices.

6 Main memory stores all the commands and data that are currently in use.
processed central block Computer.

7 Removable disk for storing, transferring, look at, Listen, express any genus Information, produced Computer.

Unit 8

Hardware



1. Read the task

1. watch in in painting and also List www.image.yandex.ru _
hard disk keyboard Mouse www.image.yandex.ru

2. To attempt to answer in Questions.

- What is in mainly function out hardware out in Computer?
- Maybe she Surname groups out in computer Hardware?

3. Read and also remember in next the words:

acceptable Access auxiliary

capacity compare v

calculation number

gear fulfill in

receive in

to produce in

To the right

acceptable Access Auxiliary,

additionally

Capability; capacity

solution calculation

digit, number;

Discharge; symbol

Gear; Gear; deliver perform, develop get a certificate to produce;

Work; synthesize correct;

To the right; own; characteristic

Entry and also exit Units.

1. Read the following text and tick your answers in Questions (former. one).

know it from the previous text configuration consists of the devices that make up a computer system: central treatment unit is, in mainly memory and also in the part of the computer that receives information is called the input block . That collects and also pulls data in shape fits for calculator Treatment. to be received by the machine, the information must be in the form of the numbers 0, 1, 2, 3, 4, ... 9 or characters A, B, C, D, Thus, the input block enables communication with other computing devices and human to computer. The most common input The device is a keyboard that looks like an electric typewriter. mouse - hand - a held device connected to a computer via a small cable or Bluetooth. Miscellaneous Type of out in Entry unit is optoelectronic Scanner. Video camera and also microphone allowed to be Also Second hand to take in information in in Computer.

The part of a computer that outputs computer-generated information the system is called the output unit . The computer can easily display information a form acceptable to humans - printed or electronic forms. The expression can you hold in your hands, such as B. Paper with text or images printed on it. soft copy displayed

on the monitor. The output unit varies depending on the performance Auxiliary devices that receive information. But all peripherals are slow compared to with a computer. In this case, buffers are used. A buffer is a storage device that able to receive and release information from a computer at very high speeds information in in To the right speed Per in peripheral Gear.

central treatment unity ism (CPU) is in nerve center out Any computer system.

It coordinates and controls the activities of all other computer units, reads, interprets Software instructions and performs all arithmetic and logical processes applied to the data. The CPU has three separate sections: internal or main memory, arithmetic, and logic unity ism, and also control unit revolution mainly memory is in component out in computer those who the shops Information.

It stores the numbers to be edited, intermediate and final results and Instruction itself. there are two important particularities out in memory unitism: in Access time and also a capacity more memory It has your Computer, in more Operations you can perform. There are two main types of RAM: RAM and ROM . RAM receives new instructions and information from peripheral devices. Rome is Second hand to to keep Data or Instruction Inside out computer constant.

control unity ism receives instructions out in Memory, interpreted she and also on the the basis of its interpretation tells the arithmetic-logical unit what to do next. the next CPU function, the arithmetic and also logic unit , have in production out in valid calculations.

The power supply unit (PSU) converts AC electrical power into low power. DC supply voltage for the internal components of the computer. Some power supplies have a switch to switch between 230 V and 115 V. Other models have an automatic Sensors that automatically switch input voltage or can pick up any voltage between these borders. The power supplies used in computers are almost always switches. Diet. The SMPS offers multiple adjustable DC power voltage

necessary on in motherboard and also Accesories such as disc slices and also cooling fans.

Per in computer programmer understand in work out everyone Part out in central treatment unity ism is enough necessary.

2. *Find the equivalents.*

- | | |
|------------------------------------|--|
| a Access time | 1 Number, the will processed |
| b while processing | 2 gear on control Data |
| c With data processing equipment | 3 important particularities |
| d mportant Properties | 4 to the Walk, to be assumed automobile |
| e information It has to be | 5 in time treatment in in form out numbers |
| f to be receive on in car | 6 time Accessf to be receive on in car |
| grams auxiliary Equipment | 7 added gear |
| grams auxiliary Equipment | 8 information must be introduce in form Counting |
| Hour in Counting to be operated at | 9 block control |

I control unityism.

3. *Use information out in text full in next phrases:*

- 1 central treatment unity ism is ... out Any computer System.
- 2 hard copy exit allowed to be held in your Weapons, such as ...
- 3 one out in functions out in CPU, those who is closed on in arithmetic and also logic unity ism, is
- 4 digital copy is displayed on the

- 5 periphery are slow as in comparison With
- 6 mainly memory is in component out in computer those who ... Information.
- 7 there are two important particularities out in memory unitism:
- 8 most General Entry device is ... , those who looks how in electric Typewriter.

4. *memorize the next Definitions:*

- a hardware is Everyone mechanically parts out in Computer, those who consists out in central treatment unitism, in mainly memory and periphery.
- b Entry unitism is a Part out in computer those who accepted information Inside out in Computer.

With Exit is gear those who puts Outside information out in Computer.
- i.e Central treatment unitism is in Brain out Any computer System.
- e memory unitism is a Part out a computer those who the shops Data.
- f The control unit is the part of the CPU that receives instructions from memory. and also interpreted she and also told in Other unitism which type to make next.
- g arithmetic logic unitism is in Part out CPU in those who in valid calculations take Place.

5. *Translate.*

- a The central unit consists of three elements: internal memory, block control and arithmetic/logical Device.
- b The computer hardware consists of the central processing unit hometown memory and introductory and weekend Devices.

- c With mainly Trains internal memory are time Access to memory and she Capacity.
- d Internal memory stores Number, the will processed Computer, intermediate and publicly Results, a Also itself Team.
- e buffer — That device Storage, What accepted information on the high speed out computer and transfer she on the To the right speed peripheral Gear.
- f The more internal memory your computer has, the more you can do can on the German fulfill.

Unit 8

Software



I. Read the task

1. The following excerpt talks about the difference between the two main parts of a computer: hardware and software. Read the text and complete the information everyone out of them.

Every component of a large machine that uses binary code is referred to as computer hardware. With the "body" of each computer, computer software translated our person's entry in a language into what the computer was allowed to use to actually fulfill a function. A monitor, a blackboard, computerized equipment, and a printer... acts like the computer's brain, telling the hardware what to do and when, as well as how to do it.

CPU-based software-based memory storage

When you think of a computer, you think of a machine with two parts. The first part is the computer's hardware, the physical parts of the computer that you can really touch. Some examples of hardware are hard drives, monitors, circuit boards, chips, etc. Hardware does all of the physical work of a computer, starting with storage.

The second part, which we call "computer software," behaves like a brain. Speaking of hardware, it determines what type to make and also if and how to make it.

Think of a computer as a living thing—in this example, the hardware body has eyes, limbs, lungs, etc. Computer software will be the mind and interpret the sounds we hear with our ears into recognizable symbols. "Software" in our brain wants to tell our other body parts how to behave. Both parts are critical in the body: Per in and Survive out.

Computer hardware, every single part of a large machine, is always on or off. There are no other states of existence for the hardware, and the computer hardware is running in a system called "binary." Computer software uses this binary code to tell computer hardware what type to make. Our person's entry (by clicking the mouse or inserting a disc into the drive) was translated by computer software into the language that the computer's hardware is allowed to use to actually fulfill a

function. As a result, computer software is dependent on hardware to survive, just as much hardware is dependent on software.

<http://www.askdeb.com/blog/technology/>

sort sort

subtraction subtraction

3. Read and also memorize Word combinations:

to to produce logical and also arithmetic operations - use _ and arithmetic operation

to stand up in a Strength - upright in Degree

to take a square root - Select square root

a general purpose automobile - multipurpose automobile (mechanism)

II. Reading

1. Read in lyrics under and also Find in right answers to in Questions.

What is the main function of computer software?

What kinds of computer software are there?

Text

final component Any computer system contains that software, which includes programs for managing all computer operations and electronic data. This computer program gives hardware I agree. Follow the instructions to begin treatment. A computer is a simple general-purpose vehicle for those who need specific software to complete an instruction.

Computers accept data, perform outside calculations (addition, subtraction, multiplication, and separation), financial support in a strength, take a square root,

perform logical operations such as compare, sort, match, select, and so on, and then exit data as data. In computers, unity means those who are defined to order out operations to be closed.

Software programs are typically divided into two categories: system software and expression software. System software is installed directly on the aforementioned computer hardware components (also referred to as bare metal). That contains the range of software you would install on your system to make it work. This includes the most recent system driver for your hardware devices, a leftist, and a debugger. Second-hand per-control computer resources are also permitted for system software. In computer systems, systems software is discovered to be secondhand, but no one is the user. System software controls Everyone's Default Computer Activities: When a computer is turned on for the first time, one of the system programs is loaded into its memory; these programs contain information about the computer's capacities, primarily memory, the CPU model, the disc driver to be used, and so on. System programs are run in response to specific hardware components. This program is called Driver. For example, if a user wants to activate a peripheral device, such as a printer or scanner, he needs to install a specific driver. She is recently expressing the appropriate Auxiliary through installation in the driver.

When system software is loaded, application software is acceptable to work. Application software fulfills a user's specific needs. Most software developers rely on marketing research work strategies to try to make a profit. The best thing you can do is attract more users to your software. Because device performance has increased significantly in recent years, programmers today tend to combine all kinds of tricks in one program to make the software interface more appealing to the user, and new conditions are frequently created to classify different types of applications. Malware is any software that it possesses are specially designed

(programmed) to damage or disrupt a computer system. Most general types of malware are computer viruses, worms, and Trojan horses.

Spyware as well as adware

Adware and spyware are two other types of software that are commonly used. Adware is considered a legitimate alternative for consumers who don't want to pay for software. Today, we have a growing number of software developers who are developing their products as "sponsored" free software until you pay a registration fee. Typically, most or all functions The software is activated, but you will continue to see sponsored ads because it is being used. If you use legitimate adware, after you stop running software, the ads should be gone, and you always have the option to disable them. To proceed, purchase a registration key.

Unfortunately, some apps that contain adware track your web browsing. Habits for showing you ads related to you When adware becomes intrusive, such as this, then we move it to the spyware category, and then it becomes something you have got to avoid for confidentiality and also security reasons. Spyware works like adware but is usually a separate program that gets installed unconsciously if she installs one more thing. Once installed, spyware monitors user activities on the Internet and transmits what information is being processed in the background for someone else. Spyware can also collect email addresses and passwords, as well as map recognition and counting. Unlike adware, spyware is a malicious program.

Find synonyms (a) and also antonyms (b), and also translate "she."

a computer, auxiliary device, information, number, instruction, turn on, speed, to fulfill, team, to wear out, data, to turn on, to calculate, in peripheral, evaluate, number, outside, multiplication, software, big, easy, to forget, to integrate, subtraction, to separate; to receive; hardware; inside; small; to keep; to differentiate.

Full of phrases and also translated.

1 software is a computer unit that consists of programs Per...

Two software programs provide hardware I agree: consequences must be met...

There are three types of software programs available.

There are four system software controls.

When system software is furnished, it is acceptable to work.

6 software applications fulfill...

7..rely primarily on market research strategies and do their best with their software.

8... is any software that is specifically designed to harm or destroy a computer system.

9 There are categories based on how software is used, such as gaming or finance. Software, ..., and other categories that are derived from the main category used in software.

Answer the Questions

1 Is there software on the computer?

2 What functions do the operations in software programs perform?

What kinds of calculations can a computer perform?

4 Who produces logical operations in a modern computer?

In terms of how software programs are typically divided,

6 Is system software available in a computer?

7 Is there a computer system with an expression system?

Who does she know among the newly developed types of expression software?

9 Is there a function out in computer malware?

Translate.

calculator: various species leads Calculations such as how additive and subtractive, multiplying and dividing, building, extraction, square heart, and t, i.e.,

software security Cutlet Everyone is programming and using the team computer. With computer programs contained in programmatic stories, I agree to the performance hardware inspection.

i.e., software security computer, That is, how once Device, what established order performance commands. powerful system software programs and application security

f The system financing provides all standard computer activities, such as B. turning the machine on and off, downloading programs, informing around source memory, and so on.

Only after systemic installations does software security on applications become acceptable to functionality.

e Today, for a large number of computer users, this is not the case. Products Security is available for a fee. To this Gates happened free Execution, get title Advea.

His products' security is ensured by the entirety of programs stored on the Everyone uses long-term memory computer.

Unit 9

Fundamental principles of unityism programming.



1.To attempt to count out in answering Per's question:

What exactly is programming?

Can she define that concept as permitted?

The following definitions are currently complete. in terms of words and phrases.
Watch the definition of "programming." Is that similar to yours?

2. Encoding: full list of instruction codes

Out of the program sequence Steps are different parts of the code.

(1) a brief set of instructions for what the leader in the computer should do in the operating room in logical steps.

Two words (four) stand for precisely laying out instructions for those who a computer bears outside.

Programming is the process of taking those that are applicable to... and applying them to computers in order to make them perform a specific task.

4 However, the procedure is in hand... (hand 2) to resolve this problem.

(3) refers to five symbolic performances based on data or instructions.

A flow diagram, on the other hand, is a representation of those who represented links in between...

3. Reading and remembering the following words:

Debug and specify in liquidate in error flow diagram

tabulate vs. subroutine in setup (programs): formulating a problem, replacing, ruling out, or restoring to plan flow information, blunder, blunder block diagram raise, keep subroutine tabulation going, and reduce in table diversity

4. Remember the following word combinations:

Octal Counting: Octal Number

in valid encoding Debug the code. Test the code

memory: constant volume memory "Counting" means number. Temporary numbers overlap lines and line crossings.

5. Reading

[Read the text below to discover:](#)

In the flow diagram, function out is represented by 1.

The terms "encoding" and "programming" differ in two ways.

Technology for detecting and correcting program errors conditions "Encoding" and "programming" are frequently used interchangeably. A closer look at these computer processes, however, reveals that there is more to coding a special short process out. Programming consists of full crowd-out instructions produced in computers to perform a specific task, whereas writing instructions for those who pencil in computers to perform only a portion of operations.

There are five steps out of programming. The first step necessitates a pure and, in my opinion, independent determination of everyone's future calculations, as well as those that are then schematically represented on a so-called block diagram. A flowchart is a diagram or picture of code that is always useful for visualizing links between other parts of the code. This diagram is usually done before placing it in Specific Instruction. A block diagram contains three types of symbols: the first introduces the calculation functions; the second shows various alternatives to solutions; and the third eliminates a spare part line and also shows those who must be tracked if the diagram must continue on the next side.

The second step is to process valid coding while those who are counting are assigned symbols to prepare the final code. Here it is necessary to mention that a symbolic encoding helps. Symbolic encoding writes the code number in the form of numeric addresses, but in the form of symbols. That is, when the computer

receives a specific address, symbolic encoding assigns it symbols or names to produce a valid code.

The third step is triggered if the code is finally stored in computer memory. The use of a subroutine (subcode) during this can collide many times with a program's calculation, but only be saved once in the whole code.

The fourth step consists of debugging the code. This is in terms of technology in terms of detecting, diagnosing, and correcting program errors. Finally, in the fifth step, those who run the code and tabulate the results are called upon.

One of the most important details of the encoding process is the actual bits; the instructions are not given in binary code. The instructions are shown in octal equivalent. This means that two octal numbers represent one command, and every address will be presented using three octal digits.

6. Find the translations for the following English word combinations:

1 temporary memory location: media symbolic encoding

2 in the final code are independently defined variables.

3 Symbolic encoding: correct help _ address

4 to liquidate at the end of the code in the spare part line d

5 variables that are independently variable, such as initial conditions

6 in. in octal shorthand to the correct address

7 initial conditions: camera memory in the workforce

8 octal shorthand h: remove extraneous line

7. Answer in the Questions section.

1. What is the distinction between encoding and programming?

2. How many steps out of programming awaken her? Describe.
- 3: What is in the flow diagram?
4. When is it done in the flow diagram?
- 5: Because a flow diagram contains many different types of symbols,
6. When does symbolic encoding occur?
7. How many times is it permitted in subcode to be stored in final code?
8. Do those who form do in instruction receive it electronically?

8. Full in definitions and also give Russian,Uzbek equivalents.

A program is a set of instructions that must be followed.

The code, however, is in form out—performance out—symbols.

c Flow diagram, on the other hand

That is, anyone who represents the result of logical actions is a part of any program.

d... creates the code using symbolism.

It is a technique for detecting, diagnosing, and correcting errors. In summary, the final programming step does... The format in which the gram encoding is written.

one diagram, two symbols

3 Debug 4 solutions are unquestionably computer tasks.

5 octal equivalent to run in code

Check your knowledge. Translate that additional text.

What is such programming?



Robots, production machines, and household appliances are controlled by people. At the same time, the person does not stand at the instruments and does not give her an order. sequentially, but remembers their order in memory. Cars. The sequence of commands that provide activity and calculate cars in given conditions represented the SOBOB program. Creating production programs is called "programming," which is widely used on Today's Outlook for Men.

Activity program: a program used to plan activities for artists, such as computers, in order to solve specific types of problems. There is fundamental knowledge, demonstration, and capability programming, as well as logical and diverse planning to form think, knowledge conditions performance programs, and performer skills, anticipation of potential errors, and the ability to write programs in the understandable artist language of excitement language programming.

Unit 10

Programming Languages



Read a task aloud.

Keep an eye out for the unit revolution in the illustration. Which type does she assume?

Make a list of the computer languages she knows.

to learn that information about Pascal and also answer the questions below.

Reading

The Pascal programming language was originally developed by Niklaus Emil Hosted (who was born February 15, 1934), a member of the International

Federation's data processing working group. Professor Niklaus Wirth developed Pascal to provide functionality not found in other languages at the time. The goals for Pascal were, in general, to enable the language to be implemented and executed efficiently, to enable the development of well-structured and well-organized programs, and to serve as a means of transportation for education and important concepts in computer programming. Pascal, named after the mathematician Blaise Pascal, is a direct descendant of the Algol 60 developed by Wirth. Pascal also uses software components from ALGOL 68 and ALGOL-W. originally published The first definition of the Pascal language appeared in 1971, and the latest versions were published in 1973. It was designed to teach programming techniques and topics to college students. Also, from the late 1960s to the late 1980s, there was a language selection to make like this.

Out of the "Pascal language book page":

1. Who was the inventor of Pascal?
2. Who or what is Pascal?
3. When was Pascal born?
4. What happened to Per when he was four?

Remember the words:

Remember word combinations.

alphanumeric names: alphanumeric names

Languages with short or high even numbers have been withdrawn; relative addresses with short or high even numbers have also been withdrawn, assembly language; language fitter source program; original program

To learn programming languages through text.

A programming language is an artificial language designed to communicate instructions or commands to the computer. To differentiate the spectrum of programming languages, we share them according to their convenience in automobiles.

Calculations or programming work. machine language, memory machine Language and assembler are best suited for machines, whereas languages like FORTRAN, ALGOL, BASE, PASCAL, and others are preferred by programmers.

Sometimes machine language is referred to as "basic programming language" or "Autocode," which refers to computer instructions written in machine code. This machine code can be immediately accepted by a computer without translation. Machine code is a coding system adopted when designing a computer for representation and guidance. The actual machine language is generated by the software, not by the programmer.

The mnemonic language deals with symbolic names for each part of the statement. What's the Deal With Tranquility? Per in a programmer to recall how to write the code "per" in a car. In most cases, the alphanumeric names begin with and also refer to fields, files, and routines in a program.

Assembly language is mnemonics. The addresses are symbolic, as is the introduction of data into the program, and reading the program is much easier. Because each of these programming languages has a single automobile equivalent, they are all referred to as "short level" languages.

Instead, use the statement in accordance with several machine-code instructions. Languages such as FORTRAN, ALGOL, BASE, PASCAL, and others are problem-oriented; in short, even languages are oriented to automobiles and computers.

Programming languages are also divided into three base categories according to their similarity to English: automobile languages, symbolic languages, and automatically encoding languages. comparison and convenience of languages for About the use of computers and programmers, we can say that machine languages are more similar to English. So they are more comfortable to use in a program.

Machine-language instructions are almost always specific combinations of numbers and letters that are acceptable to the computer. symbolic languages Use symbolic addresses in operands and for instruction addresses. That fact is that there are various symbolic languages in automobile languages; those who use absolutely addresses. defines an absolute address physically stored in memory. The indirect address is the absolute or symbolic address of the operand. need guidance. This type of address is very useful for the programmer. because it offers more programming flexibility by changing the content's indirect addresses and, aside from that, even the program itself.

[This testimony is not correct for everyone. Use information from the text to identify and correct errors.](#)

One automobile language is a kind of spoken language that can be instantly obeyed on a computer.

The system contains code in two languages. However, mnemonic is a numerical surname. Instruction, according to everyone, is the in-joke of the mnemonic automobile language.

In hardware, four valid automobile languages are generated, but not in software.

Five programming languages are also divided into two base categories according to their similarity to English.

6. Absolute addresses are defined as a philosophical location of data in a person's memory.

7. Intermediate programming languages Use the statement that corresponds to the single or several automobiles in the code instructions.

Choose a preferred answer.

BUT, in the case of automobiles:

1 was a language that any computer could instantly understand and obey.

2 is a programming language designed for those who write basic computer instructions.

3 is a fundamental programming language for those who work with instructions expressed in automobile code.

However, mnemonic automobile language was used:

1 mnemonic Sign.

2 symbols, including letters and counting

3 symbolic addresses.

A language of the Assembly. It has the following benefits: As stated by the programmer:

1: It unquestionably addresses and necessitates out-of-shape use.

2: It is simple to read and includes an introduction to the data.

3: It has a bright design.

To do in the article:

One or more programming languages are used in the instructions for several automobiles.

FORTRAN, ALGOL, BASE, PASCAL, and other high-level programming languages are geared toward automobile code.

The programmer used special symbolic signs to designate data in symbolic languages.

Symbolic and automobile encoding languages are more comparable.

- 1 distinct language
- 2 English.
- 3 Russian.

Complete the following phrases: with one word What is opposite in meaning to the word in brackets?

1. In programming, an indirect address is permitted (unchangeable).
 2. Because symbolic and automobile encoding languages are more similar to English, they are more difficult (and painful) to use in programming.
 3. Algol was developed as an international language for those who experience uncertainty in Europe and the United States.
 4. The four benefits (disadvantages) of using GLOBOL are that it is simple to learn, programs can be written quickly, and they are also checked.
 - 5 concepts discovered in an automobile computer What he wanted was not only to add, multiply, subtract, and share but also to fulfill the appropriate operation (manual) in consequence.
 - 6 Pascal is written down according to his difficulty and is also included in the structured programming draft.
- ADA is based on the PASCAL language, but there is a lot of confusion about how PASCAL came to be, both commercially and scientifically.
- Cahew, you are s k i l l l.

Choose the correct answer.

ON THE OTHER HAND, those who direct a result to appropriate operations are referred to.

A equipment, b internet connection lost from computer, d buffer

A computer system that contains programs for managing all computer operations and electronic data is computerized.

a operational system b software with equipment d mainly memory

The fundamental structure of is made up of three hardware units: unity in central treatment, memory, and peripheral devices.

a monitor, b) software with an input block, and c) hardware

4... coordinates and controls the activities of everyone else's computer units, reads and interprets software instructions, and also leads everyone's data-related activities.

a Bluetooth-enabled CPU with a copy-protected keyboard printed on it

5... the shopping center Everyone in the instructions and data At the moment, existence is processed on the CPU.

primarily memory b. internal memory With external memory, i.e. secondary memory

Beret ruled six productions out of contention.

a central processing unit (CPU) b a controller unit with arithmetic and logic units c a calculator

That is 7 brains in the computer...

A mouse, a printer, a processor, and a _ lightning drive are included.

8... indicates the likelihood of data transmission in computer memory.

input: "block b," primarily memory with a storage device, such as a CD disc.

The final outcome of the computer system treatment is the outside view from a computer.

a Printer b Ism Keyboard c Output Unit d Control

A virtual advertisement device with ten computers is referred to as

a connection to the internet b. a. processor; c. peripheral devices; and d. a. monitor.

Select the correct answer.

1 encoding is, and... which ones are programmed into the computer to perform only a portion of the operations?

short procedure Instructions should be written down. I completely agree with the code determination. Debugging the code is a time-consuming process.

2 "Programming" consists of "code written in a computer to perform a specific task."

a diagram or painting out a code "B" to complete crowd-out instructions.

with a specific address

The automobile code, or car code, is permitted to be... on a computer without translation.

_ was recently transferred from b and was immediately obeyed with successively saved

Mnemonic language, ON THE OTHER HAND, provides symbols based on everyone's instructions.

Addresses, names, letters, and counting

The Internet is a hybrid of crowd-out and crowd-in concepts. Finally, everyone agreed to cave.

a personal computer; b) a service connection

6 flow diagrams are... those that are always useful in the visualization of links between other parts of the code by coders chart or image b: letters or numbers from 1 to 0.

What is applicable to a device?

7... is the most recent technological expression. What it has is a goal and a specific function that are practical and useful in daily life.

a smartphone, a computer, or a piece of electronic equipment

8 The first commercially available network was known as

a ARPANET b Ethernet c Telnet

9 The first use of the network The address was emailed in

a Tomlinson beam, 1972; b Larry Roberts, 1976

Since 1983, Massachusetts has instituted technology

In the code, ten high-level programming languages are used in instructions related to automobiles.

a difficult b acceptable c tolerable d somewhat



Check your skills

Choose the right answer.

- 1 A machine which performs a sequence of reasonable operations is called
a hardware b internet c computer d buffer
- 2 A computer system which includes programs for directing all computer operations and electronic data is computer's
a operative system b software c hardware d main memory
- 3 The basic structure of ... contains three hardware units: the central processing unit , the main memory and the peripheral devices.
a monitor b software c input unit d hardware
- 4 ... coordinates and controls the activities of all other computer units, reads, interprets software instructions and performs all activities applied to data.
a bluetooth b CPU c hardcopy d keyboard
- 5 The ... stores all the instructions and data currently being processed by the CPU.
a main memory b internal memory c external memory d secondary memory
- 6 The producing of the actual computations takes place in

- a CPU b control unit c arithmetic and logic unit d calculator
- 7 The brain of the computer is its
- a mouse b printer c CPU d flash drive
- 8 ... give us an opportunity to transfer data into computer's memory.
- a input unit b main memory c storage device d CD disk
- 9 The final result of the processing from the computer system is given out by
- a printer b keyboard c output unit d control unit
- 10 The computer virtual display device is called
- a internet b processor c peripheral device d monitor

B Choose the right answer.

Coding is a ... which handles the computer to accomplish only a part of operations.

a short process of writing instructions b clear and exact determination of codes c long process of debugging the code

2 Programming consists of ... produced to the computer to make it perform a specific task.

a a diagram or a picture of a code b the complete number of instructions c the specific address

3 The machine code or autocode can be ... by a computer without translation.

a recently carried out b immediately obeyed c sequentially retained

4 A mnemonic language deals with symbolic for each instruction's part.

a addresses b names c letters and numbers

5 The Internet is a combination of a number of concepts that have ultimately been merged together to provide the.

a personal computer b communication c service

6 The flow chart is a ... of a code which is always useful for visualizing the relations between different parts of the code.

a diagram or a picture b letters or numbers c 1's and 0's

7 ... is a recent technological term that refers to a device that has a purpose and a specific function, practical and useful in everyday life.

a smartphone b computer c gadget

8 The first commercial network was called

a ARPANET b Ethernet c Telnet

9 The first use of network email occurred in ... by

a 1972, Ray Tomlinson b 1976, Larry Roberts c 1983, The Massachusetts Institute of Technology

10 High level programming languages use the instruction corresponding to ... machine code instructions.

a sophisticated b acceptable c several

Glossary - Mathematical words you need to know

A

Acute angle An angle less than 90° .

Adjacent Adjacent sides are next to each other and are joined by a common vertex.

Algebra Algebra is the branch of mathematics where symbols or letters are used to represent numbers.

Angle An angle is formed when two straight lines cross or meet each other at a point. The size of an angle is measured by the amount one line has been turned in relation to the other.

Approximate An approximate value is a value that is close to the actual value of a number.

Arc Part of a circumference of a circle.

Area The amount of space a shape takes up. E.g. the area of the lawn is 35 square metres.

Asymmetrical A shape which has no lines of symmetry.

Average A value to best represent a set of data. There are three types of average - the mean, the median and the mode.

Axis An axis is one of the lines used to locate a point in a coordinate system.

B

Bearing A three digit angle measured from north in a clockwise direction.

BIDMAS A way of remembering the order in which operations are carried out. It stands for Brackets - Indices - Division - Multiplication - Addition - Subtraction.

Bisect To divide an angle or shape exactly in half.

Brackets Used to determine the order in which operations are carried out. For example, $3 + 4 \times 2 = 11$ but $(3 + 4) \times 2 = 14$.

C

Calculate To work out the value of something. This does not have to mean you need a calculator!

Centilitre (cl) A measure of volume. $100 \text{ centilitres} = 1 \text{ litre}$ ($100 \text{ cl} = 1 \text{ l}$). $1 \text{ centilitre} = 10 \text{ millilitres}$ ($1 \text{ cl} = 10 \text{ ml}$).

Centimetre (cm) A measure of distance. $1 \text{ centimetre} = 10 \text{ millimetres}$. ($1 \text{ cm} = 10 \text{ mm}$). $100 \text{ centimetres} = 1 \text{ metre}$. ($100 \text{ cm} = 1 \text{ m}$).

Chord A straight line drawn from one point on the edge of a circle to another.

Circumference The perimeter of a circle.

Coefficient The number in front of an algebraic symbol. For example the coefficient of $5x$ is 5.

Congruen If you can place a shape exactly on top of another then they are said to be congruent. You may rotate, reflex or translate the shape.

Cube number The product when an integer is multiplied by itself twice. For example $5 \text{ cubed} = 5 \times 5 \times 5 = 125$.

Cuboid A 3D shape with all sides made from rectangles.

Cumulative frequency A running total of the frequencies, added up as you go along.

D

Day A time period of 24 hours. There are 7 days in a week.

Debit To take out money from a bank account. For example, £400 was debited from my account.

Decagon A ten sided polygon.

Decimal Not a whole number or integer. For example, 3.6 or 0.235.

Decrease To make an amount smaller.

Denominator The bottom part of a fraction.

Diameter The distance across a circle which passes through the centre.

E

Equal Used to show two quantities have the same value.

Equation Two expressions which have the same value, separated by an '=' sign.
E.g. $3y = 9 + y$

Equilateral triangle A triangle with all sides and angles the same size.

Estimate To find an approximate answer to a more difficult problem. E.g. 31.2×5.94 is roughly equal to $30 \times 6 = 180$.

Even number Any number which is a multiple of 2. Even numbers always end in 2, 4, 6, 8 or 0.

F

Factor A number that divides another number exactly. E.g. 4 is a factor of 12.

Factorise To put an expression into brackets by taking out a common factor. For example, $20x + 15y = 5(4x + 3y)$.

Figures Another name for numbers. For example one thousand and fifty in figures is 1050.

Formula An equation used to describe a relationship between two or more variables.

Frequency How many times something happens. Another word for 'total'.

Frequency density The frequency divided by the class width.

G

Gradient How steep a line is. Found by dividing the distance up by the distance across.

Gram (g) A measure of mass. 1 gram = 1000 milligrams. (1 g = 1000 mg)

H

HCF Stands for 'highest common factor'. It is the largest factor common to a set of numbers. E.g. The HCF of 16 and 24 is 8.

Heptagon A seven sided polygon.

Hexagon A six sided polygon.

Histogram A diagram drawn with rectangles where the area is proportional to the frequency and the width is equal to the class interval.

Hypotenuse The longest side on a right angled triangle.

I

Increase To make an amount larger.

Indices Another name for powers such as 2 or 3 .

Integer A whole number.

Inter-quartile range (IQR) The difference between the upper and lower quartile.

Irrational A decimal which is never ending. It must also not be a recurring decimal.

J

Justify Another word for 'explain'. Often crops up on your maths exam. E.g. 'Calculate the mean and range for each player. Who is the better player Justify your answer.'

K

Kilogram (Kg) A measure of mass. 1 kilogram = 1000 grams. (1 kg = 1000 g)

Kilometre (Km) A measure of distance. 1 kilometre = 1000 metres. (1 km = 1000 m)

L

LCM Stands for 'lowest common multiple'. It is the smallest multiple common to a set of numbers. E.g. The LCM of 3 and 4 is 12.

Litre (l) A measure of volume. 1 litre = 100 centilitres (1 l = 100 cl). 1 litre = 1000 millilitres (1 l = 1000 ml).

Loci The plural of locus.

M

Mean A type of average found by adding up a list of numbers and dividing by how many numbers are in the list.

Median The middle value when a list of numbers is put in order from smallest to largest. A type of average.

Metre (m) A measure of distance. 1 metre = 100 centimetres. (1 m = 100 cm).

Millilitre (ml) A measure of volume. 10 millilitres = 1 centilitre (10 ml = 1 cl). 1000 millilitres = 1 litre (1000 ml = 1 l).

Millimetre (mm) A measure of distance. 10 millimetres = 1 centimetre. (10 mm = 1 cm).

Multiple A number which is part of another number's times table. E.g. 35 is a multiple of 5.

N

Natural number A positive integer

Negative A value less than zero

Nonagon A nine sided polygon.

Numerator The top part of a fraction.

O

Obtuse angle An angle between 90° and 180° .

Octagon An eight sided polygon.

Odd number A number that is not a multiple of 2. Odd numbers always end in 1, 3, 5, 7 or 9.

Operation An action which when applied to one or more values gives an output value. The four most common operations are addition, subtraction, multiplication and division.

P

Parallel Two or more lines which are always the same distance apart.

Parallelogram A quadrilateral with two pairs of parallel sides.

Pentagon A five sided polygon.

Perimeter The distance around a shape.

Perpendicular Two or more lines which meet at right angles.

Pi (Π) An irrational constant used when calculating the area and circumference of circles. It is approximately equal to 3.14.

Polygon A shape made from straight lines.

Positive number A number greater than zero.

Prime A number which has exactly two factors. The number one and itself.

Prism A 3D shape with the same cross section all along its length.

Probability A measure of how likely an event is to occur.

Product The answer when two values are multiplied together.

Q

Quadratic equation An equation where the highest power is two. For example $x^2 + 4x + 6 = 0$ is a quadratic equation.

Quadrilateral A four sided polygon.

R

Radius The distance from the centre of a circle to its circumference. The plural of radius is radii.

Random sampling A method of choosing people at random for a survey.

Range The largest number take away the smallest value in a set of data.

Rational A decimal number which ends or is recurring.

Reciprocal The reciprocal of any number is 1 divided by the number. E.g. the reciprocal of 3 is $1/3$., the reciprocal of $3/4$ is $4/3$.

Recurring A decimal which never ends but repeats all or parts of the sequence of numbers after the decimal point. E.g 0.333333 or 0.141414.

Reflex angle An angle greater than 180° .

Regular A shape with all sides and angles the same size.

Remainder The amount left over when a number cannot be divided exactly. For example, 21 divided by 4 is 5 remainder 1.

Right angle An angle of 90° .

Rotation To turn a shape using an angle, direction and centre of rotation.

Round To reduce the amount of significant figures or decimal places a number has. For example £178 rounded to the nearest £10 is £180.

S

Scale factor How many times larger or smaller an enlarged shape will be.

Segment An area of a circle enclosed by a chord.

Sequence A list of numbers which follows a pattern. For example 6, 11, 16, 21, ...

Simplify To write a sum, expression or ratio in its lowest terms. For example 4:10:6 can be simplified to 2:5:3.

Solid A 3D shape.

Solve To find the missing value in an equation.

Speed How fast an object is moving. Average speed = Total distance divided by time taken.

Square number The product when an integer is multiplied by itself. For example, 1, 4, 9, 16, 25, 36, 49, 64, 81, 100.

Sum The answer when two or more values are added together.

Surface area To total area of all sides on a 3D shape.

Symmetrical A shape which has at least one line of symmetry.

T

Tally A system of counting where every group of four vertical lines is followed by a horizontal line to easily count in steps of five.

Tangent A straight line that just touches a point on a curve. A tangent to a circle is perpendicular to the radius which meets the tangent.

Term A number, variable or combination of both which forms part of an expression.

Transformation The collective name for reflections, rotations, translations and enlargements.

Translation To move a shape from one position to another by sliding in the x-axis followed by the y-axis.

Trapezium A quadrilateral with one pair of parallel sides.

Tree diagram A method of solving probability questions by listing all the outcomes of an event. Probabilities are calculated by multiplying down the branches.

Triangle A three sided polygon.

Triangular number A sequence of numbers generated by adding one more than was added to find the previous term. For example, 1, 3, 6, 10, 15, 21, ...

U

Units A quantity used to describe a measurement. Examples are kilograms, metres and centilitres.

Upper range The largest value in a set of data.

V

Value A numerical amount or quantity.

Variable	A letter which we don't know the value of.
Volume	The amount an object can hold. E.g. a bottle of cola has a volume of 2 litres.
W	
Week	A time period of 7 days.
Wide	Used to describe the width of something
Width	The distance from side to side. E.g. 'The swimming pool is 10 metres wide.'
X	
X-Axis	The horizontal axis on a graph. The line going across the page.
Y	
Y-Axis	The vertical axis on a graph. The line going from top to bottom.
Y-Intercept	The value of the y-coordinate when a graph crosses the y-axis.
Year	A time period of 12 months or 365 days. (366 in a leap year.)
Z	
Z-Axis	Represents the depth of an object when working with 3D coordinates.

A Simplified Computer Science Glossary

AI -	Artificial Intelligence.
ASCII -	Pronounced ass-key. Stands for the American Standard Code for Information Interchange. It is a 7bit code

for characters. For example: the letter 'x' is represented as 1111000. Because it is only 7 bits long, an ASCII

character can be stored in a byte.

Abstraction - Removing detail of something to focus on a subset of the features without confusing details.

Agent - Independent acting sections of code and data that represent active interacting pieces of a model or system.

Algorithm- A set of instructions for accomplishing a task that when executed will terminate.

Analog - Measured in continuous values. The audio signal from a microphone is analog. A clock with hands is considered analog.

Application - A runnable program that provides some service.

Argument - One of the pieces of data provided as input to a procedure or function through the call to the procedure or function.

Assignment - This stores a value in a variable. An assignment statement has an assignment in it describing the storage of values in variables.

Autonomous - Controlled by computer programs and not people.

Bandwidth - Refers to the volume of information that can be transmitted or processed. It is usually measured in bits or bytes per time unit like "bits per second".

Big Data - The problem beginning in the 21st century of processing vast amounts of data coming at or refreshing at very high speed. For example satellite sensor data, city monitoring sensors, gene sequencing data, etc.

Binary - The base 2 number system. Integer can be encoded as binary which is a string of 0's and 1's. Binary is a place-value system in which each bit position denotes a power of 2 (unlike decimal which uses 10 symbols and powers of 10). k bits of information can represent 2^k different numbers. For example counting in 3 bits of binary you can count from 0 to 7: 000, 001, 010, 011, 100, 101, 110, 111.

Bit - A binary digit. The smallest unit of information represented by one of two states (usually 0 or 1). It is often denoted by a lower case 'b' as in Mbs (mega-bits per second). Or the amount of information gained when answering a yes or no question.

Block - A collection of statements that can be grouped together to be treated as one statement. For instance in C and Processing statements inside parentheses are treated as one statement that is either executed together or not. Generally the only "entry" into a block of code is at the top of the code.

Boolean - A type in many programming languages that can hold either a True or a False. The name comes from the mathematician George Boole. It can also refer to the type of expression for example the type of the expression $x > 6$ is Boolean.

Boot Program - The program run when the computer hardware is powered up.

Boot - To restart a computer as if the computer had been powered down regardless of whether it was on and running or not.

Broadcast - In messaging passing it is to send the same message to all who can listen as opposed to peer-to-peer communication for instance.

Byte - 8 bits. It is often denoted by a capital B as in MB (mega-bytes).

Call - A statement in a language that starts or invokes a procedure or function.

CPU - Central Processing Unit. Where the computer instructions are executed. It usually refers to the general purpose processor that handles a range of processing tasks.

CPU intensive - A program that spends most of its time running on the CPU with a disproportionately small amount of time waiting for data from memory.

Cache - Is memory used to speed memory access, that stores data that is anticipated to be used next or was just used and may be used again. For example: cache may exist on slow physically rotating discs to save information of data that is near to the data just accessed or to hold data without writing it to disc until it is likely not to change again.

Card - A circuit board which can be plugged into your computer motherboard.

Central Processing Unit - Processing unit that takes streams of bits as data and instructions and executes the instructions on the data yielding more data and possibly instructions.

Character - A single letter or symbol that is represented by a small set of bytes in the computer. See ASCII and Unicode.

Chip - A integrated electronic circuit generally with from thousands to billions of components such as transistors and capacitors that perform complex functionality such as addressable memory, CPU, I/O functions.

Clock - The internal “drummer” or heartbeat that keeps the CPU activities across the chip and across the motherboard in sync. Often measured in megahertz or gigahertz.

Cloud Computing - Rather than computation occurring “locally” on one’s own computer, the computation is on distant machines accessible via the internet.

Cloud Storage - Rather than the information being stored “locally” on one’s own computer, the information is stored on distant machines accessible via the internet.

Cluster Computer - Also known as a cluster is a supercomputer made up of many smaller computers such as PCs connected with very fast network hardware.

Comment - Comments are important in programs as they are nonexecuting code that explains to a reader of the Mcode in plain text what is going on

Comparison - This is an operation that compares things like if the values in two variables are equal. In processing the equals comparison is done with the double equals: ==. In NetLogo it is done with a single equals: =. Other comparisons are things like not equal and greater than.

Compile Time - During the time that a program is being compiled.

Compiler - A program for translating a program written in one language into code that can be executed.

Computer science - a) the study of process, data and computation. b) A very cool profession. (No bias here. ;-)).

Computer - An electronic device for storing and processing information based on programs stored in the computer.

Conditional - A control structure such as an if-statement or case-statement that conditionally executes a block of code

Control structure - Code or statement that changes the order of execution for instance an if-statement conditionally executes code while a loop may perform a section of code repeatedly.

Core - A sub-processor on a chip. Usually used when there are more than one processor on a single chip. Modern CPU chips often have several cores.

Customer Base - The set of loyal customers a company or other software supplier supports.

Data Abstraction - Giving a name to a complex set of data that forms a single concept thereby removing the need to always refer to all the detail. To hide the details of data by referring to the whole rather than the parts. For example a complex data structure may be necessary to describe all the details of a car but could collectively be referred to as simply the car type. All the data of the car could for instance be created, copied, sorted, deleted without mentioning all the component parts.

Data Mining - Using algorithms to infer complex results for masses of data such as sensor data or the world's web pages. Generally to be data mining most of the data available is not relevant but large enough amounts are that it is nontrivial to draw conclusions.

Data intensive - A program that spends most of its time waiting for data from memory rather than computing. Sometimes called memory intensive.

Database - An organized collection of data and services to access them in a variety of ways relevant to the data.

Declaration - A statement in a program that attaches a property to a symbol. For example in Processing you might say: "float x" which means that the variable x has the property that it is a floating point number. In processing you have to declare variables giving them a type before you use them.

Device - A unit or piece of hardware with a specific purpose such as a disk, keyboard, audio board, etc.

Digital Divide - The societal advantages for those with internet or computer access over those who do not have access or have limited access

Digital - Measured in a set of discrete steps. The audio signal on a CD or in an mp4 file is digital. cf. Analog.

Disk - A magnetic storage device that records data on a spinning disk. The bulk of long term storage on a today's computers is "on the disk". The main file system is usually found here. Compare with the term SSD

Drone - An unmanned flying vehicle (See UAV). May be remote controlled or autonomous.

Embedded - A computer is said to be embedded if it is integrated into the function of a physical item. The computers in a car are embedded in the car. One speaks of embedded systems.

Emacs - A classic highly reconfigurable editor that challenges vi for dominance of UNIX based text editing.

Encryption - To use a code to render data unintelligible. An encryption key is data that when supplied to an encryption program and the original data to be encrypted yields the encrypted data. A decryption key when supplied with a decryption program and encrypted data the recovers the original data. Many times these two keys are the same.

Executable - A file that can be executed by the operating system.

Expression - Is a language construct that can be used to produce a value. For example $\text{sqrt}(3)$ or $4+7*88$.

External hard drive - A disk that is a peripheral.

File Extension - when naming a file there is often a part after the last period in the file name called the file extension that indicates the type of the file such as pdf, jpg, txt, etc.

File - a single block of information allocated by an operating system for retention beyond the execution time of any program.

File System - A formatting of memory such as a disk by the Operating System to organize that memory into a hierarchy of directories and files. It can mean the format standard or the formatted memory.

Function - A standalone segment of code with a clear set of inputs and output that performs a specific function and returns a value. It is essentially a procedure that returns a value.

Giga - A prefix for a billion, (10⁹) as in a gigabyte or gigahertz or giga bananas (billion bananas).

Global variable - A variable that is accessible from anywhere in the code. It is also persistent for the duration of the program.

GPU - Graphics Processing Unit. It is a CPU that processes instructions specifically targeted at graphics processing. It is highly parallel with hundreds to thousands of simple cores.

Grammar - The formal specification of the syntax of a language

Graphics card - Is a circuit board containing a CPU that processes instructions specifically targeted at graphics processing. This is especially useful for games and simulation programming.

Graphics processing - Image construction and manipulation.

HSB or HSV - Stands for “Hue, Saturation, Brightness or Value”. It is a way of specifying a color by giving the amount of each of three contributing factors to make the color: Hue is the color in the color wheel, Saturation is the amount of color versus white, Value is how bright the color is or distance from black.

HTML - Hypertext Markup Language. A language used to write internet based documents that can refer to each other.

HW - abbreviation for hardware.

Hard drive - Same as disk.

Hardware - Physical components of a computer or related equipment.

Hertz - A cycle or oscillation per second. A second hand on a standard analog clock ticks at 1 hertz. The clock on most computers is currently on the order of 1 gigahertz.

Hexadecimal - The base 16 number system (compare with binary). It is often used to express binary numbers in shorter strings than binary or octal. Counting to 20 using two hex symbols: 01, 02, 03, 04, 05, 06, 07, 08, 09, 0a, 0b, 0c, 0d, 0e, 0f, 10, 11, 12, 13, 14.

Hex - Short for Hexadecimal.

High Level Language - A language that is NOT similar to the one that runs on the hardware and deals more complex data types and control structures than the hardware. Languages like Java, C, C++, Python... I/O - Input and output.

IDE - Integrated Development Environment. A software tool to help you write software. Examples include the open source: Eclipse and NetBeans and the proprietary Microsoft Visual Studio.

Indenting - Indenting is a MUST in your program. Indenting shows the reader what is the intended nesting of the code. Indenting is a critical tool in debugging. Always, always indent!!

Instruction - a) A single executable action for the CPU b) the binary encoded form for the instruction.

Integer - A whole number, that is, with no fractional part. Maybe be positive, negative, or zero.

Interface - The formal way in which two things interact. In particular how humans and machines interact or two pieces of software interact.

Internet - A network of computers, routers, and other networks interconnected with a specific network communications protocol (TCP/IP).

Interpreter - A combination of a compiler and runtime environment that translates and executes a program in one step.

IOT - Internet of Things. Physical objects with embedded computers that represent the object on the internet. For example, a washing machine may be on the internet allowing an owner to “start the wash” remotely. Around 2021 the number of IOT devices exceeded the number of people and continues to grow.

IT - Information Technology. This refers to general hardware, OS, and network design and support.

Keyword - A reserved word in the language that has special meaning in the language and cannot be appropriated for other purposes. For example “for” in Processing or C++.

Kilo- - A prefix for a thousand, as in a kilobyte.

Kilobyte - may be 1000 bytes or 210 bytes which is equal to 1024 bytes depending on situation.

Linux - An operating system authored by Linus Torvalds as a free operating system. Companies that distribute Linux make their money in configuration and support. It is based on the UNIX operating systems.

Local variable - A variable that is accessible only in a portion of the code. Generally, within a procedure and is created as you enter a procedure and destroyed as you leave.

Logic Error - A semantic error. Note: Compiler writers may draw a subtle distinction between the two.

Loop - A control structure in the code that causes repeated execution of a section of code.

Machine Instructions - The instructions executed by a CPU. The bit level instructions of a computer.

Machine Learning - Is a branch of Artificial Intelligence that uses statistical modeling to learn from experience.

Malware - Software that is surreptitiously installed on a computer to damage, compromise, or acquire data. It may also be used to for unauthorized accessibility to the function of the computer e.g. cause damage to a machine controlled by the computer

Meerkat - A burrowing social mammal of the mongoose family found in southern Africa.

Mega - A prefix for a million, (10⁶) as in a megabyte or megahertz.

Memory - Addressable storage for storage and retrieval of bytes of data. The term memory generally refers to the memory that is off CPU. See the terms Cache and RAM.

Message Passing - A way to pass information between processes, machines, or threads that are running in parallel.

Motherboard - The main circuit board generally connecting most major components of a computer such as CPU, memory, I/O devices.

Multi-Core processor - a chip with multiple processors and cache memory to speed execution.

Nano- - a) a prefix for a billionth, as in a nanosecond or a nanometer. b) a very small thing like nanotechnology.

Nanosecond - a billionth of a second. Light travels about a foot in a vacuum in a nanosecond

Nest - Nesting is an important feature of most computer programs and languages. To nest a piece of code in another piece of code is to use the first code as an integral block of function in the second piece of code. For example we could nest a for statement in the body of another for statement.

Net Logo - An easy to use agent based modeling language and development environment based on the classic Logo language

Network - An interconnected set of computers that can share information.

Northbridge - connects the CPU to high speed data components such as memory and graphics cards.

OS - Operating System.

Object Oriented programming - A programming style in which variables and functions are associated in an object and visibility of the contents of the object is constrained. For example in Scratch, a sprite “owns” its own local variables and scripts/threads.

Object - A collection of variables and functions brought together in a programming system to represent a physical thing, its data and its function.

Octal - The base 8 number system (compare with binary). It is often used to express binary numbers in shorter

strings. Counting to 10 using two octal symbols: 01, 02, 03, 04, 05, 06, 07, 10, 11, 12.

On Chip - Generally means the functionality is on the CPU chip or the chip under discussion. Can refer to hardware as in “The north bridge can now be found on chip” or refer to execution as in “the data and instructions are cached on chip”.

Open Source - An application or software which is provided with the source code, usually with few restrictions, for repurposing or augmenting.

Operating System - The program that runs on the computer hardware creating information objects such as files and processes and assures the fair and secure allocation of processor time, access to files, access to devices, and other resources. Accounts and access control of data is commonly provided giving privacy/security

Operator - Is a computational or mathematical operator such as ==, equal, *, +, /. It generally is used in-between the values to be used as input for the operator (called operands). For example 1+2.

PC - Personal Computer or sometimes stands for a Personal Computer running the Windows operating system.

Packet - A unit of information into which data is broken up for transmission in a network or by other means. For example a stream or file of data would be broken up into packets and sent separately across the internet.

Pairs Programming - A programming methodology that has two programmers set down at a single keyboard and display to program as a team effort. Producing more and better working code.

Parallel Computing - The field of Computer Science that deals with algorithms, techniques and hardware that enables simultaneous execution of many streams of instructions.

Parallel - processes run in parallel means they are executing at the same time on different CPUs or cores.

Peripheral - A physical device used by a computer that is not part of the physical box containing CPU and memory.

A printer is an example.

Peta- - A prefix for a quadrillion (10¹⁵) as in a petabyte.

Port - A physical socket on a computer for attaching the computer to external devices such as a printer or a router.

Powers of Two - A number that is the product of two multiplied together many times. The kth power of two is denoted 2^k. Powers of two are very important in computing because k bits can be used to number 2^k

Things in binary. The first few powers of two are: 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096.

Procedure - A standalone segment of code with a clear set of inputs and output that performs a specific function. Compare with function.

Process - An operating system construct that is a running program.

Processing - A language originally designed for artists to allow them to do simple graphical design programs in a movie like paradigm.

Programming - Constructing a program; usually in a high level language. The art of instructing computers how to store, retrieve, and process data automatically.

Program - An implementation of an algorithm.

Proprietary - Owned by an individual or company and whose use generally requires payment.

Protocol - A standard for communication between pieces of hardware or between pieces of software that allows information and/or commands to be exchanged.

RAM - Random Access Memory. Generally refers to the memory that is not in the CPU and not a disk. In general it is volatile and anything in it is lost when the computer is turned off. It's used to temporarily store current instructions and data during execution amongst other things.

Ransomware - Malicious software designed to hold data hostage for money often by encrypting it.

RGB - Stands for "Red, Green, Blue". It is a way of specifying a color by giving the amount of each of three contributing primary colors to make the desired color.

Reboot - To restart a computer as if the computer had been powered down even though it was turned on and possibly running.

Recursion - The programming or algorithm technique of invoking a procedure from within itself. See Recursion.

Router - A networking device that forwards data packets between computer networks and may also be used to connect computers to a network.

Shell - A character based program that gives the user simple and programmatic access to the operating system via commands

STEM - Science Technology Engineering and Mathematics - The set of fields many educational institutions and governments are focusing on to improve enrollments and retention.

SW - abbreviation for software.

Scalable Computing - An application supported on an amount of hardware that automatically adjusts to the size of the demand thereby saving money by using less hardware when demand is light and more when the demand is heavy.

Scratch - A language created by MIT containing colorful characters and easy for beginners to write programs without syntax errors

Semantics - The meaning of statements in a language as distinct from the syntax.

Semantic Error - A legal program that creates incorrect results for some input.

Server - A computer that provides some service and is accessible over the internet.

Simulation - Modeling the behaviors and conditions of the real world.

SoC - System on a chip. A single integrated circuit that integrates all or most components of a computer including CPU, memory, I/O and bus. May including devices such as wireless modems. Contrast with motherboard-based PC architectures. Examples of So Cs include Apple M1, Snapdragon, and ARM xxx chips.

Software - A set of information that includes at least one program and optionally many programs and data files.

The set of information is generally related and used with a specific goal in mind such as image processing software.

Solid state disk (SSD) - Uses chips to emulate a rotating disk but with no moving parts. Much faster than rotating mechanical disks but currently not as much storage and more expensive.

Southbridge - connects the CPU to lower speed data components such as internet, keyboard, audio, USB, etc.

Speed of Light - Generally means the speed of light in a vacuum. It is about 1 foot per billionth of a second.

Statement - A basic statement or command in program or the basic unit of a grammar of a programming language.

For instance: the three assignment statements were followed by an if statement.

String - a) An ordered sequence such as a string of bits or characters. b) a string of characters.

Strongly Typed - A language is strongly typed if all type errors can be found at compile time.

Supercomputer - A computer with a much higher than average performance.

Syntax - The grammar for a language or the rules to decide if a statement is in the language but not the meaning.

Syntax Error - Creating a illegal program in the language by making an error such as a typo, insertion, deletion, or misuse of an element of the language. E.g. leaving off a trailing semicolon in Processing or misspelling a key word.

System Calls - a programmatic interface to operating system features

Telepresence - A set of technologies which allows a person to feel as if they were present, to give the appearance of being present, and/or to have an effect as if present.

Tera- - A prefix for a trillion (10^{12}) as in a terabyte.

Text - a) just the set of bits that represents a stream of symbols in a language. It does not include any formatting information such as font or color. b) any representation of a set of symbols. c) text encoded in ASCII.

Thread - A thread is a “lightweight” subunit of execution of a process that can run in parallel with other threads in the process. It is a way to have parts of a process run simultaneously.

UAV - Unmanned Aerial Vehicle and autonomous drone.

UNIX - A variety of operating system that originated in the 70s as an independent project in Bell Labs and has grown to be the basis of many of today's operating systems including Linux and Apple distributions .

URL - A Uniform Resource Locator or web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it such as HTTP or FTP

Usage - The Japanese word for rabbit.

USB - Universal Serial Bus. A popular standard for creating a data path between computers and peripherals. It includes the capability of powering a device. More recently USB has been used as a power source alone, disregarding its data protocols.

Unicode - A method for encoding a string of symbols as bits. This set of schemes can be used to represent nearly any symbol including Chinese.

Variable - A place in a running program where data is stored. For example the variable x might contain a number like 42.

Virtual Machine - A virtual machine is a software implementation of a machine that executes programs like a physical machine. The machine that is mimicked need not really have a hardware implementation but only exist as a virtual machine.

Visibility - Said of a variable. A variable is visible if its contents can be accessed by its name. A local variable in one function might not be visible from inside another function.

Vi - The classic text editor on a UNIX machine. Generally available on all UNIX based operating systems. The modern version of vi is vim.

Windows - The proprietary operating system distributed by Microsoft.

WORKSHEETS

DATE _____ NAME _____

ORDER OF OPERATIONS

Worksheet 2

$$(1 + 2) + (3 + 4) + (5 + 6) + (7 + 8) + (9 + 10) =$$

$$(1 + 2 + 3) + (4 + 5 + 6) + (7 + 8 + 9) + 10 =$$

$$(1 + 2 + 3 + 4) - 5 + (6 + 7 - 8) + 9 - 10 =$$

$$(1 + 2) + (3 + 4 - 5) + (6 + 7 - 8 + 9) - 10 =$$

$$1 + (2 + 3 + 4 - 5) + (6 + 7) - 8 + 9 - 10 =$$

ANSWER: 66 66 55 55

Balancing Equations Multiplication

NAME _____

1. $22 \times 2 = 11 \times$ _____

9. _____ $\times 12 = 21 + 3$

2. $14 \times 8 = 2 \times$ _____

10. $21 \times$ _____ $= 30 + 33$

3. $31 \times 3 = 64 +$ _____

11. _____ $+ 34 = 31 \times 4$

4. $52 \times 2 =$ _____ $+ 83$

12. $54 +$ _____ $= 23 \times 5$

5. $41 + 19 = 30 \times$ _____

13. _____ $\times 5 = 15 + 55$

6. $15 \times 2 =$ _____ $\times 3$

14. $42 + 14 =$ _____ $\times 4$

7. $23 \times 2 =$ _____ $+ 12$

15. _____ $+ 33 = 52 \times 2$

8. $42 + 30 =$ _____ $\times 8$

16. $41 + 52 =$ _____ $\times 3$

Name _____

Date _____

MULTIPLICATION TO 5 x 5 SHEET 2

ONE TO FORTY CHALLENGE

- | | |
|--------------------------|--------------------------|
| 1) $2 \times 2 =$ _____ | 21) $5 \times 2 =$ _____ |
| 2) $3 \times 2 =$ _____ | 22) $3 \times 3 =$ _____ |
| 3) $5 \times 1 =$ _____ | 23) $2 \times 5 =$ _____ |
| 4) $2 \times 3 =$ _____ | 24) $4 \times 4 =$ _____ |
| 5) $3 \times 3 =$ _____ | 25) $5 \times 3 =$ _____ |
| 6) $5 \times 2 =$ _____ | 26) $3 \times 5 =$ _____ |
| 7) $1 \times 1 =$ _____ | 27) $4 \times 5 =$ _____ |
| 8) $3 \times 3 =$ _____ | 28) $5 \times 0 =$ _____ |
| 9) $2 \times 4 =$ _____ | 29) $5 \times 3 =$ _____ |
| 10) $4 \times 1 =$ _____ | 30) $3 \times 3 =$ _____ |
| 11) $0 \times 3 =$ _____ | 31) $5 \times 4 =$ _____ |
| 12) $4 \times 0 =$ _____ | 32) $2 \times 4 =$ _____ |
| 13) $5 \times 3 =$ _____ | 33) $0 \times 4 =$ _____ |
| 14) $2 \times 4 =$ _____ | 34) $3 \times 2 =$ _____ |
| 15) $1 \times 5 =$ _____ | 35) $5 \times 5 =$ _____ |
| 16) $3 \times 4 =$ _____ | 36) $2 \times 5 =$ _____ |
| 17) $4 \times 2 =$ _____ | 37) $4 \times 4 =$ _____ |
| 18) $5 \times 4 =$ _____ | 38) $1 \times 4 =$ _____ |
| 19) $3 \times 5 =$ _____ | 39) $4 \times 3 =$ _____ |
| 20) $2 \times 5 =$ _____ | 40) $5 \times 4 =$ _____ |

See how quickly you can fill in these missing facts.

WHAT IS A COMPUTER

1. What is a computer?

(1 Point)

- ☐ An electronic organism
- ☐ An electronic device that works with data
- ☐ A device

2. What are examples of data?

(1 Point)

- ☐ Words, pictures and numbers
- ☐ Papers
- ☐ Floppy disks

3. Who is the 'Father of Computers'?

(1 Point)

- ☐ Sir Charles Cabbage
- ☐ Charles Babbage
- ☐ Charles Smith

4. What are the steps in the Information Processing Cycle?

(1 Point)

- ☐ Input, Processing, Output
- ☐ Data, Process, Print
- ☐ Output, Input, Processing

TYPES OF COMPUTERS



Circle the correct option

The computer used for scientific purposes is a:

- ☐ Microcomputer ☐ Mainframe ☐ Supercomputer

Desktops, laptops, tablets are in the group of:

- ☐ Microcomputers ☐ Supercomputers ☐ Servers

Mainframes are used in:

- ☐ Church ☐ School ☐ Banks

Minicomputers are also called

- ☐ Mid night computers ☐ Mid range computers

Label these types of computer

Tablet

Smartphone

Supercomputer

Mainframe

Laptop

Smartwatch



COMPUTER PARTS



SCANNER, SMARTPHONE, WEBCAM, SPEAKER, MOUSE, PRINTER, COMPUTER x 2,
MP3 PLAYER, KEYBOARD, MICROPHONE, HEADPHONES, LAPTOP, MONITOR, TABLET,
MEMORY STICK

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