

Brilliant Public School , Sitamarhi



VII Mathematics Practice Paper

Session : 2012-13

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BRILLIANT PUBLIC SCHOOL, SITAMARHI-843301

MONTHLY SPLIT UP OF SYLLABUS

Session:2012-13

MATHEMATICS

Month	No. of working Days	Tentative No. of Periods	Chapter No.	Lesson No.	Name of the Chapter	Class Room Period	Total No. of Periods
April / May	23+3=26	26+4=30	1	1	Integers	2	30
			2	2	Fractions and Decimals	16	
June / July	6+25=31	7+23=30	3	3	Data Handling	14	30
			4	4	Simple Equations	14	
August	24	28	5	5	Lines and Angles	8	28
			6	6	The Triangle and its Properties	18	
September	22	18	7	7	Congruence of Triangles	7	18
			8	8	Comparing Quantities	9	
October	16	18	9	9	Rational Numbers	11	22+14=36 (Revision)
			10	10	Practical Geometry (after CT)	9	
November	22	18	Revision	11	Perimeter and Area	12	24
			10 (After CT)	12	Algebraic Expressions	10	
					Continue in Jan		
December	17	19	11	13	Exponents and Powers	9	
			12	14	Symmetry	5	
January	24	21	12	15	Visualising Solid Shapes	8	(Revision)
February	23	26	13	16	Revision for S.E.E.	26	26
			14				
March	6	7	(Revision)	17	Revision for S.E.E.	7	7



Integers

Operations on Integers

When two positive integers are added, we get a positive integer; $9 + 2 = 11$.

When two negative integers are added, we get a negative integer; $-2 + (-3) = -5$.

When a positive and a negative integer are added, the sign of the sum is always the sign of the bigger number of the two, without considering their sign $55 + -25 = 30$ and $-55 + 25 = -30$.

The additive inverse of any integer a is $-a$, and the additive inverse of $(-a)$ is a . Integer (-12) = Additive Inverse (12) .

Subtraction is the opposite of addition and therefore, we add the additive inverse of the integer that is being subtracted, to the other integer. Hence, $23 - 43 = 23 + \text{Additive Inverse of } 43 = 23 + (-43) = -20$.

The product of a positive and a negative integer is a negative integer.

If the number of negative integers in a product is even, then the product is a positive integer, and if the number of negative integers in a product is odd, then the product is a negative integer.

Division is the inverse operation of multiplication.

The division of a negative integer by a positive integer results in a negative integer.

The division of a positive integer by a negative integer results in a negative integer.

The division of a negative integer by a negative integer results in a positive integer.

For any integer p , p multiplied with zero is equal to zero multiplied with p , which is equal to zero.

For any integer p , p divided by zero is not defined, and zero divided by p is equal to zero, where p is not equal to zero.

Properties of Integers

Integers are closed under addition and subtraction. That is, $a + b$ and $a - b$ are again integers, where a and b are any integers.

Addition is commutative for integers, i.e., $a + b = b + a$, for all integers a and b .

Addition is associative for integers, i.e., $(a + b) + c = a + (b + c)$, for all integers a , b and c .

Integer 0 is the identity under addition. That is, $a + 0 = 0 + a = a$, for every integer a .

Integers are closed under multiplication. That is, $a \times b$ is an integer, for any two integers a and b .

Multiplication is commutative for integers. That is, $a \times b = b \times a$ for any integers a and b .

The integer 1 is the identity under multiplication, i.e., $1 \times a = a \times 1 = a$, for any integer a .

Multiplication is associative for integers, i.e., $(a \times b) \times c = a \times (b \times c)$, for any three integers a , b and c .

Distributive property of multiplication over addition: For any integers a , b , c we have $a \times (b + c) = a \times b + a \times c$.

Distributive property of multiplication integers a , b , c we have $a \times (b - c) = a \times b -$

$a \times c$.

Fractions and Decimals

Multiplication and Division on Fraction

Divisions of Fractions

To obtain the reciprocal of a fraction, interchange the numerator with denominator.

To divide a whole number by a fraction, take the reciprocal of the fraction and then multiply it with the whole number.

To divide a fraction by a whole number, multiply the fraction with the reciprocal of the whole number.

To divide a fraction by a fraction, multiply the first fraction with the reciprocal of the second fraction.

Multiplication and Division on Decimals

Multiplication of Decimals

To multiply a whole number by a decimal number, follow these steps:

Ignore the decimal and multiply the two numbers.

Count the number of digits to the right of decimal point in the original decimal number.

Insert the decimal, from right to left, in the answer by the same count.

To multiply a decimal number by a decimal number, follow these steps:

Ignore the decimals and multiply the two numbers.

Count the number of digits to the right of decimal point in both the decimal numbers.

Add up the number of digits counted and insert the decimal, from right to left, in the answer by the same count.

To multiply a decimal number with 10, 100 or 1000, follow these steps:

While multiplying a decimal number with 10, retain the original number and shift the decimal to the right by one place.

While multiplying a decimal number with 100, retain the original number and shift the decimal to the right by two places.

While multiplying a decimal number with 1000, retain the original number and shift the decimal to the right by three places.

Division of Decimals

To divide a decimal number by a whole number, follow these steps:

Convert the decimal number into a fraction.

Take the reciprocal of the divisor.

Multiply the reciprocal with the fraction.

To divide a decimal number by another decimal number, follow these steps:

Convert both the decimal numbers into fractions.

Take the reciprocal of the divisor.

Multiply the reciprocal with the fraction.

Data Handling

Data Representation

A bar graph is a visual representation or organized data.

A bar graph consists of bars which have uniform width.

The lengths of the bars depend on the frequency or the scale you choose.

The double bar graph helps in comparing two data sets.

The likelihood of getting an outcome is known as probability.

Data Value

Mean or Average is calculate using the following formula:

$$\frac{\text{Sum of observations}}{\text{Number of observations}}$$

Range is calculated by subtracting the lowest observation from the highest observation.

Mode is calculate in the following manner:

Step 1: Arrange data in ascending order.

Step 2: Tabulate the data in a frequency distribution table.

Step 3: The most frequently occurring observation will be the mode.

Median is calculated in the following manner:

Step 1: Arrange date in ascending order

Step 2: The value that lies in the middle such that half of the observations lie above it and the other half below it will be the median.

The mean, mode and median are representative values of a group of observations or data and lie between the minimum and maximum values of data. They are also called the measures of the central tendency.

Simple Equations

Introduction to Simple Equations

An equation is a condition of equality between two mathematical expressions.

If the left hand side of an equation is equal to its right hand side for any value of the variable, then that value is called the solution of that equation.

When we add or subtract an equation on both side by the same number, the value of the left hand side of the equation is always equal to its right hand side.

When we divide or multiply an equation on both sides by a non-zero number, the value of the left hand side of the equation is always equal to its right hand side.

We can build many equations with a given solution.

Application of Simple Equations

To find the solution of an equation, we have to perform identical mathematical operations on the two sides of the equations so that only the variable remains on one side.

Transposing means moving a terms of the equation to the other side. Transposing a number is the same as adding or subtracting the same number from both sides of the equation.

When a number is transposed from one side of the equation to the other side, its sign changes.

Lines and Angles

Angles

An angle is formed when two lines or line segments meet.

Complementary angles are a pair of angles, the sum of whose measure is equal to 90° .

Supplementary angles are a pair of angles, the sum of whose measure is equal to 180° .

Adjacent angles have a common vertex, a common arm and non-common arms are on either side of the common arm.

Adjacent angles have no common interior points.

A linear pair is a pair of adjacent angles whose non-common sides are opposite rays.

The angles in a linear pair are supplementary.

Vertically opposite angles are opposite to each other, and these angles are equal in measure.

Pairs of Lines

Lines that meet at a point are called intersecting lines.

Lines that always remain the same distance apart and never meet are called parallel lines.

A line that intersects two or more lines at a distinct point is called a transversal.

When two lines are intersected by a transversal, pairs of corresponding angles, alternate angles and interior angles on the same side of the transversal are formed.

Angles formed on the same side of the transversal, on the same side of the two lines and at corresponding vertices are called corresponding angles.

When two lines are intersected by a transversal, the pairs of angles on opposite sides of the transversal at the two distinct points of intersection and between the two lines are called alternate interior angles.

When two lines are intersected by a transversal, the pairs of angles on opposite sides of the transversal at the two distinct points of intersection but outside the two lines are called alternate exterior angles.

Angles that have different vertices lie on the same side of the transversal and are interior angles are called consecutive interior angles or allied or co-interior angles.

If two parallel lines are cut by a transversal then each pair of interior angles on the same side of transversal are supplementary, each pair of corresponding angles are equal and each pair of alternate interior angles are equal.

When a transversal cuts two lines such that pairs of corresponding angles are equal, the lines are parallel.

When a transversal cuts two lines such that pairs of alternate interior angles are equal, the lines are parallel.

When a transversal cuts two lines such that pairs of interior angles on the same side of the transversal are supplementary, the lines are parallel.

The Triangle and its Properties

Triangles

A triangle has three sides, three angles and three vertices.

Triangles are classified as equilateral, isosceles or scalene, based on their sides.

Triangles are classified as acute-angled, obtuse-angled or right-angled, based on the measurement of their angles.

An equilateral triangle has all its sides equal and all its angles measure 60 degrees.

An isosceles triangle has two of its sides equal and the angles opposite its equal sides measure the same.

A scalene triangle has neither its sides equal nor its angles the same measure.

All the angles of an acute-angled triangle measure less than 90 degrees.

One of the angles of an obtuse-angled triangle measures more than 90 degrees but less than 180 degrees.

One of the angles of a right-angled triangle is equal to 90 degrees.

The median of a triangle is a line segment drawn from the vertex to the midpoint of the opposite side.

The altitude of a triangle is a line segment from a vertex which is perpendicular to the opposite side of that vertex.

The medians of a triangle meet at a point inside a triangle called centroid.

The altitudes of a triangle meet at point known as orthocenter.

Properties of Triangles

An exterior angle of a triangle is equal to the sum of its interior opposite angles.

The total measure of the three angles of a triangle is 180° .

Sum of the length of any two sides of a triangle is greater than the length of the third side.

In a right-angled triangle, the side opposite to the right angle is called the hypotenuse and the other two sides are called its legs.

The Pythagoras Property states that in a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares on the legs.

If the Pythagoras Property holds, the triangle must be right-angled.

Congruence of Triangles

Congruence of Plane Figures

If two objects are of exactly the same shape and size, they are said to be congruent and the relation between the two objects being congruent is called congruence.

The method of superposition examines the congruence of plane figures, line segments and angles.

A plane figure is any shape that can be drawn in two dimensions.

Two plane figures are congruent, if each, when superimposed on the other, covers it exactly.

If two line segments have the same or equal length, they are congruent. Also, if two line segments are congruent, they have the same length.

If two angles have the same measure, they are congruent. Also, if two angles are congruent, their measures are the same.

If two angles are congruent, the length of their arms do not matter.

Criteria for Congruence of Triangles

Two triangles are congruent if all the sides and all the angles of one triangle are equal to the corresponding sides and angles of the other triangle.

According to SSS congruence criterion, two triangles are congruent, if three sides of one triangle are equal to the three corresponding sides of the other triangle.

According to SAS congruence criterion, two triangles are congruent if two sides and the included angle of one triangle are equal to the corresponding two sides and the included angle of the other triangle.

According to RHS congruence criterion, two right-angled triangles are congruent, if the hypotenuse and a side of one triangle are equal to the hypotenuse and the corresponding side of the other triangle.

According to ASA congruence criterion, two triangles are congruent if two angles and the included side of one triangle are equal to the corresponding two angles and the included side of the other triangle.

AAA congruence does not exist. Two triangles need not be congruent even if their corresponding angles are equal. In such a case, one of the triangles can be an enlarged or a smaller copy of the other.

Comparing Quantities

Ratios and Proportions

The ratio of two quantities in the same units is a fraction that shows how many times one quantity is greater/smaller than the other.

To calculate the ratio of two quantities, the units must be the same.

Compare different ratios to determine whether they are equivalent ratios or not.

If two fractions are equal then the given ratios are equivalent.

When two ratios are equivalent then the four quantities are said to be in proportion.

Ratio and proportion problems can be solved by using two methods, unitary method and equating ratios to make proportions and solve the equation.

Percentage means per hundred. It is another method used to compare quantities.

Fractions can be compared by converting them into percentages.

Percentages

Percentage is the numerator, of a fraction, whose denominator is hundred.

To convert a fraction to percentage, multiply it by hundred and then place the % sign.

Conversions

To convert a percentage into fraction:

Step 1: Drop the percentage sign, and then divide the number by hundred.

To convert a percentage into a decimal:

Step 1: Remove the percent sign.

Step 2: Divide the number by hundred or move the decimal point two places to the left in the numerator.

To convert a decimal into percentage:

Step 1: Convert the decimal into a fraction

Step 2: Multiply the fraction by hundred or shift the decimal point two places to the right

Step 3: Put a percent sign next to the number

Application of Percentages

$$I = \frac{P \times R \times T}{100}$$

If you are given any three of these quantities the fourth one can be calculate using the interest formula.

Rational Numbers

Introduction to Rational Numbers

Whole numbers, integers, fractions and decimal numbers together form the group of rational numbers.

A rational number is a number that can be written in the form p/q , where p and q are integers and $q \neq 0$.

The denominator of a rational number can never be zero.

A rational number is positive if both its numerator and denominator are positive integers or negative integers.

If either the numerator or the denominator of a rational number is a negative integer, then the rational number is called a negative rational number.

The rational number zero is neither negative nor positive.

On the number line:

Positive rational numbers are represented to the right of 0.

Negative rational numbers are represented to the left of 0.

By multiplying or dividing both the numerator and the denominator of a rational number by the same non-zero integer, we can get another rational number that is equivalent to the given rational number.

A rational number is said to be in its standard form if its numerator and denominator have no common factor other than 1, and its denominator is a positive integer.

To reduce a rational number to its standard form, divide its numerator and denominator by their Highest Common Factor of HCF.

To find the standard form of a rational number with a negative integer as the denominator, divide its numerator and denominator by their HCF with a minus sign.

Comparison of Rational Numbers

While comparing positive rational numbers with the same denominator the number with the greatest numerator is the largest.

A positive rational number is always greater than a negative rational number.

While comparing negative rational numbers with the same denominator, compare their numerators ignoring the minus sign. The number with the greatest numerator is the smallest.

To compare rational numbers with different denominators, convert them into equivalent rational numbers with the same denominator that is equal to the LCM of their respective denominators.

You can find infinite rational numbers between any two given rational numbers.

Operations on Rational Numbers

The denominator of the sum or difference of two rational numbers with the same denominator is the same as the common denominator of the given numbers.

The numerator of the sum of two rational numbers with the same denominator is the sum of the numerators of the given numbers with their correct sign.

The numerator of the difference of two rational numbers with the same denominator is the difference between the numerators of the given numbers with their correct sign.

To add or subtract rational numbers with different denominators, we convert them into equivalent rational numbers having common denominator equal to the LCM of the denominators of the given numbers.

Two rational numbers whose sum is zero are called additive inverse of each other.

The numerator and denominator of the product of two rational numbers are equal to the product of their individual numerators and denominators.

Two rational numbers whose product is 1 are called reciprocals of each other.

A rational number and its reciprocal always have the same sign.

To divide one rational number by a second rational number, we actually multiply the first number by the reciprocal of the second number.

Practical Geometry

Construction of Triangles

The sum of the measures of the three angles of a triangle is 180° .

The sum of the lengths of any two sides of a triangle is greater than the length of the third side.

The difference between the lengths of any two sides of a triangle is less than the length of the third side.

The measure of an exterior angle is equal to the sum of interior opposite angles.

To construct a triangle, we need to know any one of the following measurements:

- Lengths of three sides

- Two sides and the included angle

- Two angles and the included side

- The hypotenuse and one side in the case of a right-angled triangle

Construction of Parallel Lines

A parallel line can be constructed, if a line and a point outside the line are given.

Steps for construction of parallel lines:

Draw a line.

Mark two points, one on the line and the other outside the line.

Join the points.

Measure one of the interior angles that are formed by the intersecting lines.

Construct either an alternate angle or a corresponding angle (with the same measure) at the point marked outside the line.

Draw a line passing through the point marked outside the line.

Perimeter and Area

Plane Figures

Perimeter of a rectangle is $2(l + b)$.

Area of a rectangle is $l \times b$.

Perimeter of a square is $4 \times \text{side}$.

Area of a square is $\text{side} \times \text{side}$.

Area of a parallelogram is $\text{base} \times \text{height}$.

Area of a triangle is $\frac{1}{2} \text{base} \times \text{height}$.

1 cm = 10 mm

10 mm = 1 cm

1 m² = 10000 cm²

1 hectare = 10,000 m²

Circles

The radius of a circle is half the diameter of the circle.

π = Circumference divided by the diameter.

Circumference of a circle = $2\pi r = \pi d$,

where d is the diameter of a circle. $\pi = \frac{22}{7}$

or 3.14 (approximately).

Area of a circle = πr^2 , where r is the radius of the circle.

Area between two concentric circles = Area of outer circle minus the area of the inner circle.

Algebraic Expressions

Understanding Algebraic Expressions

Expressions formed by combining constants and variables are called algebraic expressions.

The parts of an algebraic expression joined together by plus (+) signs are called its terms.

A term that contains variable is called a variable term.

A term that contains only a number is called a constant term.

The constant and variables, whose product makes a term of an algebraic expression, are called the factors of that term.

The numerical factor of a variable term is called its coefficient.

The variable factors of a term are called its algebraic factors.

Terms that have the same algebraic factors are called like terms.

Terms that have different algebraic factors are called unlike terms.

Algebraic expressions that contain only one term are called monomials.

Algebraic expressions that contain only two unlike terms are called binomials.

Algebraic expressions that contain only three unlike terms are called trinomials.

All algebraic expressions that have one or more terms are called polynomials.

Operations on Algebraic Expressions

To add or subtract algebraic expressions, rearrange the terms in the sum of the given algebraic expressions, so that their like terms and constants are grouped together.

While rearranging terms, move them with the correct '+' or '-' sign before them.

To add like terms in an algebraic expression, multiply the sum of their coefficients with their common algebraic factors.

To subtract like terms in an algebraic expression, multiply the difference of their coefficients with their common algebraic factors.

Unlike terms remain unchanged in the sum or difference of algebraic expressions.

Application of Algebraic Expressions

We can find the value of algebraic expression, if the values of all the variables in the expression are known.

We can write formulas for the perimeter and area for different geometrical figures using simple, easy to remember algebraic expressions.

Algebraic expressions can be used to represent number patterns.

Exponents and Powers

Exponents and Powers

A mathematics representation indicating the number of times a number is multiplied by itself is called an exponent.

If $a^b = c$, where a , b and c are integers, then a^b is called the exponential form of c .

When numbers are expressed as the product of the powers of their prime factors, we get the prime factor product form.

The order of factors in the prime factor product form of a number can be interchanged without changing the value of the number.

When numbers are expressed using powers of 10, we get the expanded form of numbers.

The value of an exponential number with a negative base raised to the power of an even number is positive.

The value of an exponential number with a negative base raised to the power of an odd number is negative.

If the base of two exponential numbers is the same positive integer, then the number with the greater exponent is greater than the number with the smaller exponent.

Laws of Exponents

For any non-zero integers a and b

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$a^m \times b^m = (a \times b)^m$$

$$a^m \div b^m = \left(\frac{a}{b}\right)^m$$

$$a^0 = 1$$

$$(a^m)^n = a^{m \times n}$$

Where m, n are whole numbers.

Symmetry

Line Symmetry

The line of symmetry is an imaginary line where you could fold the image or object and have both halves match exactly.

All polygons are not symmetrical.

A regular polygon is a polygon which is equiangular (all angles are equal) and equilateral (all sides have the same length).

A regular polygon has as many lines of symmetry as it has sides.

Rotational Symmetry

If an object looks exactly the same at least once during a complete 360° rotation, then it has rotational symmetry.

The fixed point about which a shape or an object turns during rotation is called the centre of rotation.

The angle at which a shape or an object looks the same during rotation is called the angle of rotation.

The number of times a shape or an object appears the same during a 360° rotation is called the order of rotation symmetry.

A circle is the most symmetrical figure.

Some capital letters of the English alphabet are symmetrical in shape. For example, Z, H and I.

Visualising Solid Shapes

Introduction to Solid Shapes

Plane or two dimensional figures have only length and breadth and they lie in a single plane whereas three dimensional solids have length, breadth and height and they do not lie entirely on a plane.

The flat surfaces that form the skin of solid are called its faces, the line segments that form the skeleton are called edges and the points where the edges meet are called vertices.

All two dimensional figures can be identified as the faces of three dimensional solid shapes.

The net of a three dimensional solid is a two dimensional skeleton outline, which when folded results in the three dimensional shape.

Solid shapes can be drawn on a flat surface, which is known as the two dimensional representation of a three dimensional solid.

Sketches of solid are two types; oblique and isometric.

Oblique sketches are drawn on squared paper. They do not have exact lengths but still convey all the significant aspects of the appearance of a solid.

Isometric sketches are drawn on dotted or isometric sheets and have the exact measurements of solids.

Viewing the different section of Solids

Three dimensional objects are solids have lengths, breadth and height and look different from various locations.

Sections of a solid can be viewed in a number of ways.

Visualizing a solid help to analyse or see the hidden parts of the solid.

A solid can be viewed from different angles. Viewing a solid from the front, side and top are three most common ways of viewing the solid.

Cutting or slicing a solid with result in its cross-section, which is also one way of viewing the section of a solid.

Observing the two dimensional shadow of a three dimension solid is also a method of viewing a solid.

Shadows of solids are of different sizes depending on the position of the solid and he position of the source of light.

Mathematics for Class 7

1. Integers

Q 1 Write the greatest negative integer.

Mark (1)

Q 2 Find the product $(-Z) \times (-A)$?

Mark (1)

Q 3 Find the value of x in the given pattern 12, 9, 6, 3, 0, x.

Mark (1)

Q 4 Write in descending order: -5, -17, 10, -14 and 2.

Mark (1)

Q 5 Write the smallest positive integer.

Mark (1)

Q 6 Write the integer used to represent 200 m above the sea level.

Mark (1)

Q 7 What will be the sign of additive inverse of a negative integer?

Mark (1)

Q 8 Subtract 2112 from 0.

Mark (1)

Q 9 Fill in the blank : $(-30) + \{(-34) + (-82)\} = \{(-30) + (-34)\} + \underline{\hspace{2cm}}$

Mark (1)

Q 10 Fill in the blank: $-(-100) = \underline{\hspace{2cm}}$

Mark (1)

Q 11 Fill in the blank: $-345 \times \underline{\hspace{1cm}} = 345$.

Mark (1)

Q 12 If $a \times 200 = 0$, find a.

Mark (1)

Q 13 Evaluate: $1331/(-11)$.

Mark (1)

Q 14 Find the additive inverse of 10.

Mark (1)

Q 15 Evaluate: $13 - (-13)$

Mark (1)

Q 16 A boy walks 60 m due North and then 75 m due South. Find the position of the boy with respect to his starting point.

Marks (2)

Q 17 Find the additive inverse of the following:

(i) 250

(ii) -150

Marks (2)

Q 18 The sum of two integers is -71 . If one of them is -32 , find the other.

Marks (2)

Q 19 Subtract (-128) from the sum of 55 and (-38) .

Marks (2)

Q 20 Subtract the sum of (-545) and 125 from 1005.

Marks (2)

Q 21 Subtract:

(i) 512 from 0

(ii) -35 from 70

Marks (2)

Q 22 Find the sum:

(i) -256 and 328

(ii) 2002 and -135

Marks (2)

Q 23 (i) By how much does -2 exceed -6?

(ii) What should we subtract from -5 to get -2?

(iii) On subtraction of -4 from 0, what do we get?

Marks (3)

Q 24

Fill in the blanks :

(i) $(-5) \times \underline{\hspace{1cm}} = 5$

(ii) $\underline{\hspace{1cm}} \div 55 = 0$

(iii) $\underline{\hspace{1cm}} \div (-17) = -4$

Marks (3)

Q 25 Multiply:

- (i) - 25 by 11.
- (ii) -15 by -12.
- (iii) 0 by - 33.

Marks (3)

Q 26 Evaluate:

- (i) $14 + 7$
- (ii) $16 + (-8)$
- (iii) $(-23) + (-11)$

Marks (3)

Q 27 Find the product:

- (i) $2 \times 4 \times -6$
- (ii) $-5 \times -6 \times -7$

Marks (3)

Q 28 Fill in the blanks:

- (i) $\{(-25) + (-33)\} + (-82) = (-25) + \{(-33) + (\underline{\hspace{1cm}})\}$
- (ii) $-(-77) = \underline{\hspace{1cm}}$

Marks (3)

Q 29 Simplify: $\{(-10) - (-5)\} + \{(-22) + (-40)\}$

Marks (3)

Q 30 The sum of two integers is -25. If one of them is -30, find the value of the other.

Marks (3)

Q 31 If $a = -5$, $b = -6$ and $c = 8$, then show that

- (i) $(a + b) + c = a + (b + c)$,
- (ii) $(a - b) \neq (b - a)$.

Marks (4)

Q 32 Simplify.

- (i) $(-25) \times 72 + (-25) \times 42$
- (ii) $8 \times 13 + 8 \times (-7)$

Marks (4)

Q 33 In a class test containing 15 questions, 3 marks are given for every correct answer and (-1) marks given for every incorrect answer.

- (i) Gurpreet attempts all the questions but only 9 of her answers are correct. What is her total score?
- (ii) One of her friends gets only 5 answers correct. What will be her score?

Marks (4)

Q 34 In a class test containing 15 questions, 3 marks are given for every correct answer and (-1) marks given for every incorrect answer.

- (i) Gurpreet attempts all the questions but only 9 of her answers are correct. What is her total score?
 (ii) One of her friends gets only 5 answers correct. What will be her score?

Marks (4)

Q 35 In a class test containing 20 questions, 5 marks are awarded for every correct answer and (-2) marks awarded for every incorrect answer and 0 for questions not attempted.

- (i) Mohan gets fourteen correct and six incorrect answers. What is his score?
 (ii) Reshma gets fifteen correct answers and five incorrect answers. What is her score?
 (iii) Heena gets ten correct and eight incorrect answers out of the seven questions she attempts. What is her score?

Marks (4)

Q 36 In a class test containing 10 questions, 5 marks are awarded for every correct answer and (-2) marks awarded for every incorrect answer and 0 for questions not attempted.

- (i) Mohan gets four correct and six incorrect answers. What is his score?
 (ii) Reshma gets five correct answers and five incorrect answers. What is her score?
 (iii) Heena gets two correct and five incorrect answers out of the seven questions she attempts. What is her score?

Marks (4)

Most Important Questions

Q 1 Write all integers between

- (i) -6 and 3 (ii) -2 and 3
 (iii) -4 and 0 (iv) 0 and 3

Q 2 Write the following integers in increasing order:

- (i) -8, 5, 0, -12, 2, -9, 15
 (ii) -106, 107, -320, -7, 185

Q 3 Write the following integers in decreasing order:

- (i) -15, 0, -2, -9, 7, 6, -5, 10
 (ii) -154, 123, -205, -89, -74

Q 4 Mark the following integers on a number line:

- (i) 9 (ii) -5
 (iii) 0 (iv) 6

Q 5 State true or false:

- (i) The sum of an integer and its opposite is always zero.
 (ii) The sum of two negative integers is positive.
 (iii) The sum of a positive integer and a negative integer is negative.
 (iv) The sum of three different integers can never be zero.
 (v) The addition of two integers can be zero.
 (vi) The subtraction of two integers can never be zero.

Q 6 Add.

- (i) +75 and +56 (ii) +42 and -20
 (iii) -87 and -946 (iv) -570 and 0

Q 7 Subtract.

- (i) 5 from 9 (ii) 0 from +39
(iii) -55 from +55 (iv) -59 from -100

Q 8 Q 8. Write all the integers (in increasing order) between the given pairs:

- (i) 0 and -8 (ii) -6 and 6
(iii) -2 and -10 (iv) -8 and -15

Q 9 Draw a number and answer the following:

- (i) Which number will we reach if we move 4 numbers to the right of -2?
(ii) Which number will we reach if we move 5 numbers to the left of 1?
(iii) If we are at -8 on the number line, in which direction should we move to reach -13?
(iv) If we are at -6 on the number line, in which direction should we move to reach -1?

Q 10 Is there any integer which is neither positive nor negative?

Q 11 For each of the following statements, write true (T) or false (F):

- (i) $-13 > -8 - (-4)$
(ii) $(-5) + (-2) < 7$

Q 12 Represent the following points with +ve or -ve sign:

- (i) 6 steps to the left of zero
(ii) 8 steps to the right of zero
(iii) 13 steps to the right of zero
(iv) 5 steps to the left of zero

Q 13 In each of the following pairs, which number is to the right of the other on the number line?

- (i) 3, 7 (ii) -4, -8
(iii) 0, -4 (iv) 1, -10
(v) 2, 5 (vi) -1, 3

Q 14 Fill in the blanks.

- (i) $7 + \dots = 0$ (ii) $-9 + \dots = 0$
(iii) $+15 + (-15) = \dots$ (iv) $(-17) - \dots = -4$

Q 15 Evaluate.

- (i) $105 + (-61) + (-29)$ (ii) $253 + (-524) + (-730) + 894$
(iii) $-48 + 37 - 28 - 1$

Q 16 Fill in the blanks:

- (vi) $(-8) + \dots = 0$ (ii) $29 + \dots = 0$
(i) $12 + (-12) = \dots$ (iv) $(-4) + \dots = -14$
(ii) $(-256) + \dots = -496$ (vi) $\dots - 215 = -115$

Q 17 Is $74 - (-38) = (-38) - 74$?

Q 18 The sum of two integers is -29. If one of them is -21, what is the other?

Q 19 Subtract -4 from 11 and 11 from -4. Is $11 - (-4) = (-4) - (-11)$?

Q 20 Subtract 34 from the sum of -18 and 26.

Q 21 Subtract the sum of -7 and -17 from the sum of -36 and 42?

Q 22 The sum of two integers is 42. If one of the integer is -20, find the other.

Q 23 The sum of two integers is -386. if one of them is 64, determine the other.

Q 24 Add -36 to the difference of -19 and -4 .

Q 25 Find the additive inverse of each of the following integers:

- (i) 52 (ii) -176
(iii) 0 (iv) 1

Q 26 Find the successor of each of the following integers:

- (i) -42 (ii) -1
(iii) 0 (iv) -200

Q 27 Find the predecessor of each of the following integers:

- (i) 0 (ii) 1
(iii) -99 (iv) -125

Q 28 Complete the following table:

+	-6	-4	-2	0	2	4	6
6						10	
4							
2							8
0	-6						
-2							
-4						0	
-6				-6			

Q 29 State true or false:

- (i) The product of two integers can be zero.
(ii) The product of two negative integers is negative.
(iii) The product of three negative integers is positive.
(iv) The product of a positive integer and a negative integer may be zero.
(v) If a and b are two integers, then $a \times b$ is always greater than both a and b .
(vi) If a and b are two integers, then $a \times b$ is always greater than either a and b .

Q 30 Complete the following table:

X	-4	-5	5	2	-2	0	-1
-2						10	
-3							
2							8
-1	-6						
0							

Q 31 Multiply.

- (i) 8 and 7 (ii) -3 and -6
(iii) -12 and $+47$ (iv) $+48$ and 0

Q 32 Divide.

- (i) 24 by -3 (ii) 0 by +8
(iii) -37 by +1 (iv) +13 by -1

Q 33 Fill in the blanks.

- (i)x (-16) = 400 (ii) 49 $\square$ =-49
(iii) 23 x= 0 (iv) 12 x (-1) =
(v) 7 $\square$ $\times$ = 1 (vi) $\square$ / 4 = 3

Q 34 Evaluate.

- (i) 13 x (-2) x 3
(ii) (-2) x (-3) x (-4) x (-5) x (-6)
(iii) (-576) / (-4)

Q 35 Find the product of

- (i) -6 and 7 (ii) 13 and -14
(iii) 0 and -71 (iv) 0 and -6

Q 36 State whether the following statement are true or false:

- (i) $(-2) \times (-3) < 5$
(ii) $(-3 \times 0) < 1$
(iii) $(+2) \times (-3) > -6$
(iv) $0 \times (-4) = 0$
(v) $0 \square 0 = 0$
(vi) $(-56) \tilde{(-8)} = 7$
(vii) $(-13) \tilde{0} = 0$
(viii) $0 \tilde{(-22)} = 0$

Q 37 Determine the integer whose product with (-1) is

- (i) 0 (ii) 51 (iii) -105

Q 38 What will be the sign of the product if we multiply together

- (i) 15 negative integers and 7 positive integers?
(ii) 24 negative integers and 3 positive integers?

Q 39 The product of two integers is -68. If one of them is 17, find the other.

Q 40 The product of two integers is 120. If one of them is -15, find the other.

2. Fractions and Decimals

Q 1 How much is 48 more than 28.3?

Mark (1)

Q 2 Express 55 paise as rupees using decimals.

Mark (1)

Q 3 Arrange in descending order: 0.07, 0.7, 7.07, 0.007, 0.77

Mark (1)

$$4 \div \frac{1}{4} = \underline{\quad}$$

Q 4 Fill in the blank :

Mark (1)

Q 5 Fill in the blank : 165 paise = ____ rupees.

Mark (1)

Q 6 How many kilometers are there in 654 m.

Mark (1)

Q 7 Fill in the blank: 8.45 km = ____ m

Mark (1)

Q 8 Fill in the blank:

$$1000 / 0.001 = \underline{\quad}$$

Mark (1)

$$\frac{1}{5} \text{ of } 255 = \underline{\quad}$$

Q 9 Fill in the blank :

Mark (1)

Q 10 How many litres are there in 755 ml ?

Mark (1)

Q 11 What is the reciprocal of 1?

Mark (1)

Q 12 Fill in the blank :

1/3 is the reciprocal of ____.

Mark (1)

Q 13 Fill in the blank given below by any one of >, < or = 2.005 ____ 2.05

Mark (1)

Q 14 Find the value of 'a' if $1243.075 = 1000 + 200 + a + 3 + \frac{7}{100} + \frac{5}{1000}$.

Mark (1)

Q 15 Write an equivalent fraction of $\frac{133}{125}$.

Mark (1)

Q 16 A player played 14 games. Out of which he won 8 games. Write the fraction of the games he won.

Mark (1)

Q 17 Find the average of 6.4, 8.4, 13.1.

Mark (1)

Q 18 1) ___ has no reciprocal.

2) Compare: 2.05 ___ 2.50 (use <, >, =)

Marks (2)

Q 19 Ravi sows 4 rose plants in a row. The distance between two adjacent rose plants is $\frac{3}{7}$ m. Find the distance between the first and the last plant.

Marks (2)

Q 20 Ravi has 10 CD's. He gives $\frac{2}{5}$ of the CD's to his friend. How much CD's are left with Ravi?

Marks (2)

Q 21 A wire is broken into two piece. If the wire is $3\frac{3}{4}$ m long and one piece is $1\frac{1}{2}$ m long, find the length of the other piece.

Marks (2)

Q 22 Find the product $0.3 \times 0.03 \times 0.003$.

Marks (2)

Q 23 By what number should $1\frac{1}{2}$ be divided to get $\frac{2}{3}$.

Marks (2)

Q 24 Divide: 0.4 by 0.2

Marks (2)

Q 25

State true or false :

1) Reciprocal of $\frac{2}{3}$ is $\frac{3}{2}$.

2) $\frac{1}{2}$ of 36 is 16 .

3) The perimeter of an equilateral triangle of side 3.3 cm is 9.27 cm .

Marks (3)

Q 26 Arrange $1\frac{1}{4}, 3\frac{1}{2}, 1\frac{1}{8}, 7\frac{1}{24}, 1\frac{5}{12}$ in ascending order.

Marks (3)

Q 27 Simplify $\frac{1}{2} + \frac{3}{7} - 1\frac{1}{4} - 2\frac{1}{2}$

Marks (3)

Q 28 Raghu has 175 sweets out of which he gives one fifth part part to his sister and out of the remaining he gives two seventh part to his youngest brother. How many sweets are left with him?

Marks (3)

Q 29 The length of a rectangle is 17.23 cm and breadth is 13.5 cm. Find the perimeter and area of the rectangle.

Marks (3)

Most Important Questions

Q 1

Solve:

(i) $\frac{9}{11} - \frac{4}{15}$

(ii) $2\frac{2}{3} + 3\frac{1}{2}$

$$(i) \frac{1}{18} + \frac{1}{18} =$$

$$(ii) \frac{1}{56} + \frac{2}{56} =$$

$$(iii) \frac{4}{6} + \frac{1}{6} =$$

$$(iv) \frac{2}{23} + \frac{11}{23} =$$

$$(v) \frac{126}{251} + \frac{126}{251} =$$

$$(vi) \frac{342}{831} + \frac{288}{831} =$$

$$Q2 \quad (vii) \frac{1251}{2555} + \frac{899}{2555} =$$

Add the following fractions :

$$(i) \frac{3}{4} + \frac{1}{2} =$$

$$(ii) \frac{1}{5} + \frac{7}{10} =$$

$$(iii) \frac{1}{4} + \frac{7}{16} =$$

$$(iv) \frac{3}{8} + \frac{3}{32} =$$

$$(v) \frac{3}{8} + \frac{1}{64} =$$

$$(vi) \frac{3}{9} + \frac{5}{81} =$$

$$Q3 \quad (vii) \frac{126}{256} + \frac{9}{512} =$$

Arrange the following in ascending order :

$$(i) \frac{2}{9}, \frac{2}{3}, \frac{8}{21}$$

$$Q4 \quad (ii) \frac{1}{5}, \frac{3}{7}, \frac{7}{10}$$

$$10\frac{2}{3}$$

Q 5 A Rectangular sheet of paper is $12\frac{1}{2}$ cm long and $10\frac{2}{3}$ cm wide. Find its perimeter.

Q 6

Multiply and express as mixed fraction :

(a) $3 \times 5\frac{1}{5}$

(b) $3\frac{1}{4} \times 6$

(c) $\frac{13}{11} \times 6$

(d) $\frac{9}{7} \times 6$

Q 7

Subtract the following fractions:

(a) $\frac{5}{2} - \frac{3}{2}$

(b) $\frac{7}{11} - \frac{2}{11}$

(c) $\frac{3}{5} - \frac{1}{5}$

(d) $\frac{7}{13} - \frac{11}{13}$

Subtract the following fractions :

(a) $\frac{2}{5} - \frac{8}{25}$

(b) $\frac{7}{13} - \frac{9}{26}$

(c) $\frac{3}{4} - \frac{5}{8}$

(d) $\frac{7}{11} - \frac{17}{121}$

Q 8

Q 9 If the area of a rectangle is 2500 sq. mts and a area of square of 1000 sq. mts is embedded inside it. Find the area of the remaining portion?

Q 10 Find the perimeter of a triangle whose each side measures 10cm, 15cm and 25cm.

Multiply and reduce to lowest form :

(a) $7 \times \frac{5}{10}$

(b) $5 \times \frac{1}{3}$

(c) $20 \times \frac{4}{5}$

(d) $27 \times \frac{5}{9}$

(e) $11 \times \frac{7}{121}$

Q 11

Multiply the following :

(a) $\frac{1}{2} \times \frac{1}{3}$

(b) $\frac{2}{3} \times \frac{5}{7}$

(c) $\frac{5}{11} \times \frac{3}{4}$

(d) $\frac{6}{13} \times \frac{2}{5}$

(e) $\frac{7}{11} \times \frac{3}{7}$

Q 12

Divide the following fractions :

(a) $\frac{1}{2} \div 2$

(b) $\frac{10}{21} \div 5$

(c) $\frac{15}{44} \div 11$

(d) $\frac{12}{65} \div 15$

(e) $\frac{3}{11} \div 5$

Q 13

Divide the following fractions

(a) $\frac{1}{4} \div \frac{1}{2}$

(b) $\frac{2}{21} \div \frac{2}{3}$

(c) $\frac{15}{484} \div \frac{3}{44}$

(d) $\frac{4}{325} \div \frac{2}{25}$

(e) $\frac{3}{55} \div \frac{3}{11}$

Q 14

Q 15

Divide the following fractions :

(a) $\frac{1}{2} \div 10$

(b) $\frac{3}{21} \div 100$

(c) $\frac{5}{11} \div 10$

(d) $\frac{4}{13} \div 100$

(e) $\frac{1}{5} \div 1000$

Q 16

Multiply the following decimal numbers :

(a) 0.0025×1000

(b) 0.75×100

(c) 0.3256×10

(d) 1.298×1000

(e) 5.4856×100

Divide the following decimal numbers :

(a) $0.25 \div 10$

(b) $1.659 \div 100$

(c) $2365.547 \div 1000$

(d) $957.15 \div 100$

Q 17 (e) $670.497 \div 1000$

Q 18

Divide the following :

(a) $0.025 \div 25$

(b) $.0169 \div 13$

(c) $2.2 \div 11$

(d) $515.05 \div 5$

(e) $.6702 \div 2$

Q 19

Divide the following :

(a) $0.121 \div 0.11$

(b) $0.169 \div 0.013$

(c) $0.625 \div 2.5$

(d) $0.1111 \div 11$

(e) $0.009 \div 0.9$

Q 20

Divide the following :

(a) $0.9 \div 0.99$

(b) $0.05 \div 0.025$

(c) $11 \div 0.121$

(d) $0.6 \div 0.66$

(e) $0.3 \div 0.636$

3. Data Handling

Q 1 Find the mean of first three odd natural numbers.

Mark (1)

Q 2 What is the median of the values 27, 48, 72, 38, 14, 21, 22 ?

Mark (1)

Q 3 Find the mean of the first three multiples of 3.

Mark (1)

Q 4 Find the mode of the numbers.11, 12, 11, 11, 12, 11,13,13,11.

Mark (1)

Q 5 What is the probability of the occurrence of an odd number if a die is tossed once?

Mark (1)

Q 6 Marks obtained by 12 students in a class are 27, 32, 35, 28, 42, 46, 38, 41, 39, 40, 46, 36. Find the number of students who obtained the highest mark and also obtain the highest marks?

Mark (1)

Q 7 A box has 15 balls.Out of these, 3 balls are yellow, 5 balls are red and the remaining are green. Find the probability that a ball drawn is red.

Mark (1)

Q 8 Define the term 'Data'.

Mark (1)

Q 9 State true or false and give one example to justify your answer: Mean is always one of the numbers in a data.

Mark (1)

Q 10 Fill in the blank:

The value which lies in the middle of the data (when arranged in ascending or descending order) is called.....

Mark (1)

Q 11 Define Mode of the data.

Mark (1)

Q 12 Define arithmetic mean.

Mark (1)

Q 13 Define bar graph.

Marks (2)

Q 14 Find the median of the following data:

28, 46, 75, 36, 18, 20, 25

Marks (2)

Q 15 What is the probability of the occurrence of an even number ? if a die is tossed once.

Marks (2)

Q 16 Find the mode of the following numbers:

1, 3, 1, 5, 2, 5, 2, 2, 1, 2

Marks (2)

Q 17 Find the mean of first 3 prime numbers.

Marks (2)

Q 18 Find the mean of first 3 prime numbers.

Marks (2)

Q 19 Following are the marks obtained by students of class VI.

23, 35, 40, 49, 49.5, 15, 15.5, 17.5.

Find :

- 1) Highest Marks
- 2) Lowest Marks
- 3) Range

Marks (2)

Q 20 In a survey of 100 ladies, it was found that 36 like coffee while 64 dislike it. If a lady is chosen at random what is the probability that the chosen lady

- 1) likes coffee,
- 2) dislikes coffee?

Marks (3)

Q 21 Find the mean of first five multiples of 5.

Marks (3)

Q 22 Represent the following data using suitable scale :

Pastries Sold on	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
No of Pastries Sold	350	400	250	300	200	450

Marks (3)

Q 23 A box has 10 balls. 3 balls are yellow, 2 balls are red and the remaining are green. Find the probability that a ball drawn is

- a) red.
- b) yellow.
- c) green.

Marks (3)

Q 24 The height of 15 students are given in a 165, 155, 168, 160, 163, 162, 165, 168, 156, 159, 160, 164, 163, 165, 160.

Find :

- (i) The range of height
- (ii) The Mode
- (iii) The Median

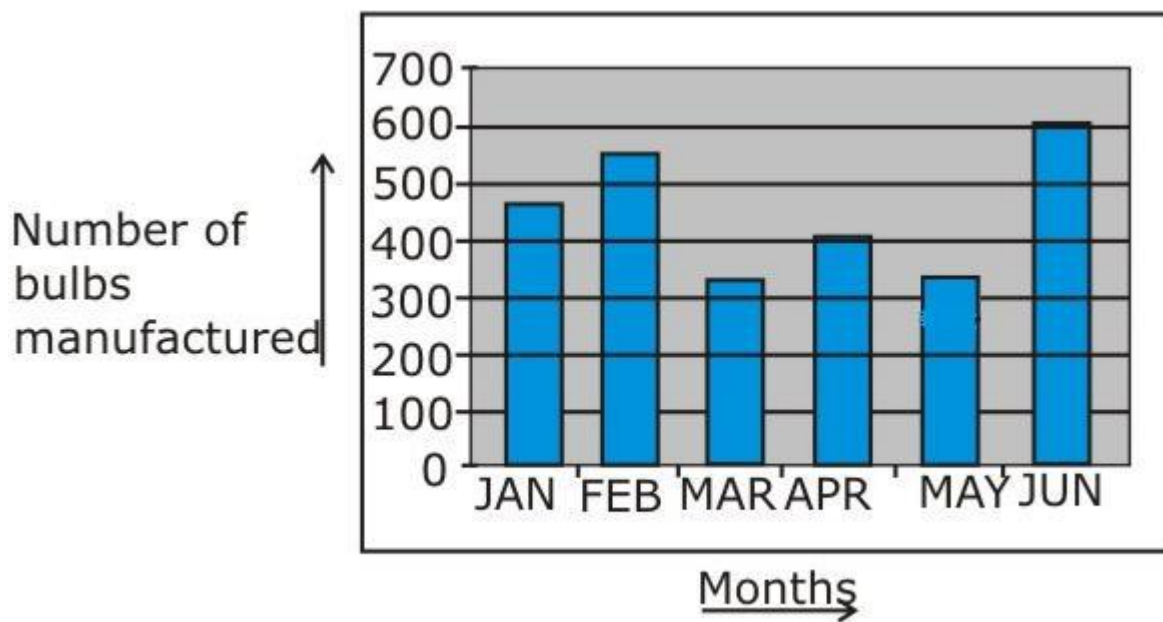
Marks (3)

Q 25 Find the mean of the following table:

Height	165	170	175	180
No of girls	9	8	11	12

Marks (4)

Q 26 Read the graph carefully and answer the following:



- (i) What does the graph represent?
- (ii) In which month was the production maximum?
- (iii) In which two months was the production equal?
- (iv) In which month was the production minimum?
- (v) What was the production in January?

Marks (4)

Q 27 The following table shows the weight of 12 students in a class.

Weight (in Kg)	48	50	52	54	58
No. of students	4	3	2	2	1

Find the Median of the weights.

Marks (4)

Q 28 A die is thrown 150 times and the outcomes are given :

Outcome	1	2	3	4	5	6
Frequency	39	42	31	15	13	0

Find the probability of getting a outcome

- (i) 3
- (ii) 6
- (iii) 1
- (iv) 4
- (v) 2

Marks (4)

Q 29 The marks scored by 15 students (out of 25) in a mathematics test are as follows: 19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20

Find the mode and median of this data. Are they same?

Marks (4)

Q 30 The weights (in kg.) of 15 students in a class are:

38, 42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47

- (i) Find the mode and median of this data.
- (ii) Is there more than one mode?

Marks (4)

Q 31 Following table shows the points of each player scored in four games:

Player	Game 1	Game 2	Game 3	Game 4
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not play	13

Now, answer the following questions:

- (i) Find the mean to determine A's average number of points scored per game.
- (ii) To find the mean number of points per game for C, would you divide the total points by 3 or by 4? Why?
- (iii) B played in all the four games. How would you find the mean?
- (iv) Who was the best performer?

Marks (4)

Q 32 The number of children in six different classes is given below. Represent the data on a bar graph.

Class	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Number of children	135	120	95	100	90	80

- (a) How would you choose a scale?
(b) Answer the following questions:
(i) Which class has the maximum and minimum number of children?
(ii) Find the ratio of the students of class sixth to the students of class eight.

Marks (4)

Q 33 Organise the following marks in a class assessment in a tabular form:

4, 6, 7, 5, 3, 5, 4, 5, 2, 6, 2, 5, 1, 9, 6, 5, 8, 4, 6, 7

- (i) Which number is the highest?
(ii) Which number is the lowest?
(iii) What is the range of the data?
(iv) Find the arithmetic mean.

Marks (4)

Q 34 The marks scored by 15 students (out of 25) in a English test are as follows:

19, 25, 23, 21, 9, 21, 15, 10, 5, 16, 25, 21, 24, 12, 21

Find the mode and median of this data. Are they same?

Marks (4)

Q 35 The weights (in kg.) of 15 students in a class are:

38, 42, 35, 37, 45, 50, 32, 43, 43, 40, 36, 38, 43, 38, 47

- (i) Find the mode and median of this data.
(ii) Is there more than one mode?

Marks (4)

Q 36 Following table shows the points of each player scored in four games:

Player	Game 1	Game 2	Game 3	Game 4
A	14	16	10	10
B	0	8	6	4
C	8	11	Did not play	13

Now, answer the following questions:

- (i) Find the mean to determine A's average number of points scored per game.
(ii) To find the mean number of points per game for C, would you divide the total points by 3 or by 4? Why?
(iii) B played in all the four games. How would you find the mean?
(iv) Who was the best performer?

Marks (4)

Q 37 The number of chairs in six different classes is given below. Represent the data on a bar graph.

Class	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Number of chairs	135	120	95	100	90	80

- (a) How would you choose a scale?
(b) Answer the following questions:
(i) Which class has the maximum and minimum number of chairs?
(ii) Find the ratio of the chairs of class seventh to the chairs of class ninth.

Marks (4)

Q 38 Organise the following marks in a class assessment in a tabular form:

1, 2, 5, 3, 2, 1, 4, 1, 5, 7, 8, 9, 2, 8, 1, 3, 5, 6, 5, 7

- (i) Which number is the highest?
(ii) Which number is the lowest?
(iii) What is the range of the data?
(iv) Find the arithmetic mean.

Marks (4)

Most Important Questions

Q 1 The runs scored in eight innings are 58, 75, 40, 36, 47, 46, 0, and 98. The mean of the scores is:

- (a) 48 (b) 50
(c) 47 (d) 60

Q 2 Mean of 10 items was found to be 15. On verification, it was found that an item 21 was miscopied as 12. The correct mean is

- (a) 15.9 (b) 14.1
(c) 24 (d) None of these

Q 3 Find the mean of first five multiples of 5.

Q 4 On the basis of following data give answers the following questions. The rainfall (in mm) in a city on 7 days of a certain week was recorded as follows.

Day	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
Rainfall (in mm)	0.3	11.4	7.1	2.9	4.5	9.1	11.2

a) The mean rainfall for the week is

- (i) 5.64 mm (ii) 6.64 mm
(iii) 6.18 mm (iv) 4.54 mm

b) On how many days was the rainfall less than the mean rainfall ?

- (a) 2 (b) 3
(c) 5 (d) 5

Q 5 The mean of the first 9 whole numbers is:

- (a) 3 (b) 2
- (c) 4 (d) 6

Q 6 The marks obtained by a group of students in a science test are

76, 85, 90, 72, 89, 95, 56, 48, and 75,

then the range of the marks obtained is

- (a) 45 (b) 48
- (c) 52 (d) 47

Q 7 Define

- (i) Data
- (ii) Mean

Q 8 Find the mean of first three prime number.

Q 9 Marks Obtain by 12 students in a class are 27, 32, 35, 28, 42, 46, 38, 41, 39, 40, 46, 36.

Find the number of students who obtained the Highest Marks.

Q 10 Find the range of the given data: 10, 23, 45, 35, 90, 24, 35 and 18.

Q 11 Find the mean of these numbers 3, -7, 5, 13, -2.

Q 12 Sale of English and Hindi books in the year 1995, 1996, 1997, and 1998 are given below:

Years	1995	1996	1997	1998
English	350	300	785	570
Hindi	500	425	845	640

In which year was the difference in the sale of the two language books least?

- (a) 1995 (b) 1996
- (c) 1997 (d) 1998

Q 13 The median of the data 18, 24, 42, 47, 49, 18, 25, 35, 22 is

- (a) 25 (b) 24
- (c) 35 (d) 22

Q 14 What is the median of the given values?

27, 48, 72, 38, 14, 21, 22

Q 15 is the central value of the array.

Q 16 is the maximum frequency value of data.

Q 17 Find the mode of the following numbers.

1, 3, 1, 5, 2, 5, 2, 2, 1, 2

Q 18 The height of 15 students are given in a class are 165, 155, 168, 160, 163, 160, 165, 168, 156, 159, 160, 164, 163, 160. Find:

- (a) the range of heights
- (b) the mode
- (c) the median.

Q 19 Which statement is false in the following statement?

- (a) The data 1, 2, 1, 1, 2, 1, 3, 4, has mode 1.
- (b) The data 4, 6, 6, 4 has mean 5.
- (c) The median is always one in a data.
- (d) Mean = number of observation / sum of all observation

Q 20 The mode of the following data

11,12,14,16,15,13,14,19,15,16,16,15,18,15,14,17,16,15,15,14,11,13,14,15,17,14,15,13,14 is

- (a) 15 (b) 14
- (c) 13 (d) 12

Q 21 The median of the data:

19, 17, 14, 13, 12, 11, 18, 10, 7, 9, 11 is

- (a) 11 (b) 12
- (c) 14 (d) 13

Q 22 The median of 10, 14, 11, 9, 8, 12, 6 is

- (a) 10 (b) 12
- (c) 14 (d) 11

Q 23 The median of the following data 11, 29, 17, 21, 13, 31, 39, 19 is

- (a) 18 (b) 19
- (c) 21 (d) 20

Q 24 What is the probability of the occurrence of an Odd number if a dice is tossed once?

Q 25 A box has 15 balls. 3 balls are yellow, 5 balls are red and the remaining are green. Find the probability that a ball drawn is red.

Q 26 What is the probability of the occurrence of an even number if a dice is loosed once?

Q 27 A box has 10 balls, 3 balls are yellow, 2 balls are red and the remaining are green. Find the probability that a ball drawn is:

- a) Red
- b) Yellow
- c) Green

Q 28 In a survey of 100 ladies, it was found that 36 like coffee while 64 dislike it. If a lady is choose at random what is that probability that the chosen

- 1) Like coffee
- 2) Dislike coffee

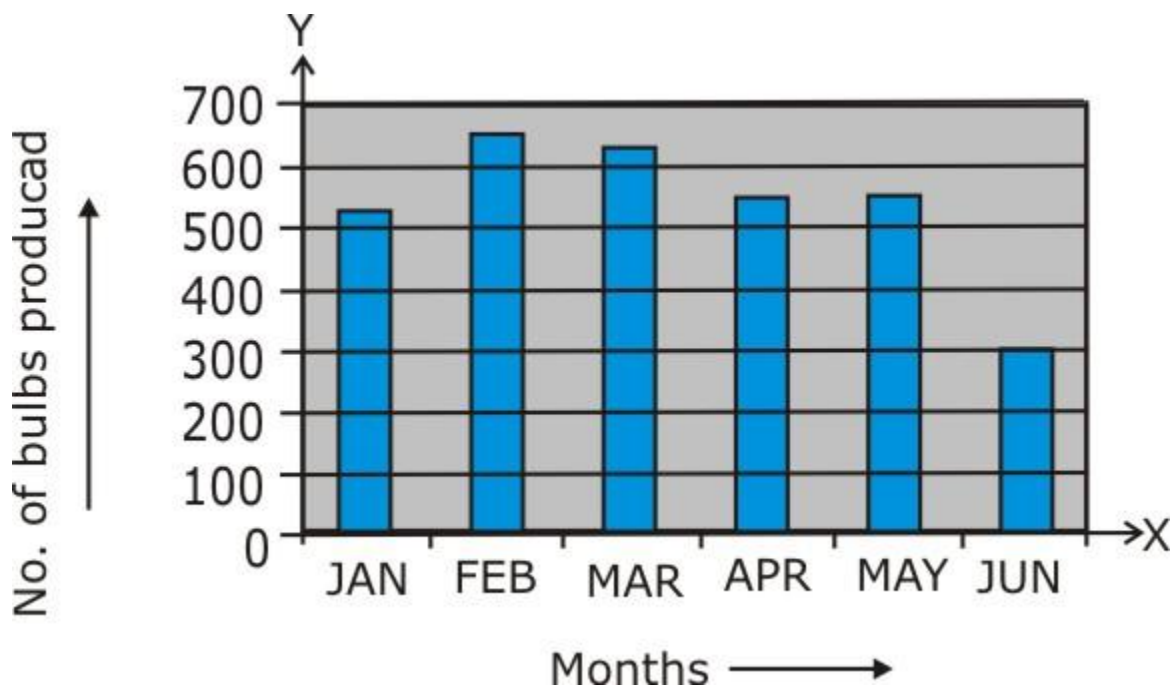
Q 29 A dice is thrown 150 times and the outcomes are given

Out come	1	2	3	4	5	6
Frequency	39	42	31	15	13	-

When a dice is thrown at random, find the probability of getting

- (i) 3 (ii) 6 (iii) 1 (iv) 4 (v) 2

Q 30 Read the graph carefully and answer the following



- (i) What does the graph represent?
(ii) In which month was the production maximum?
(iii) In which two months was the production equal?
(iv) In which month was the production minimum?
(v) What was the production in January?

Q 31 What is the probability of getting 3 when a dice is thrown once?

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
(c) $\frac{1}{4}$ (d) $\frac{1}{6}$

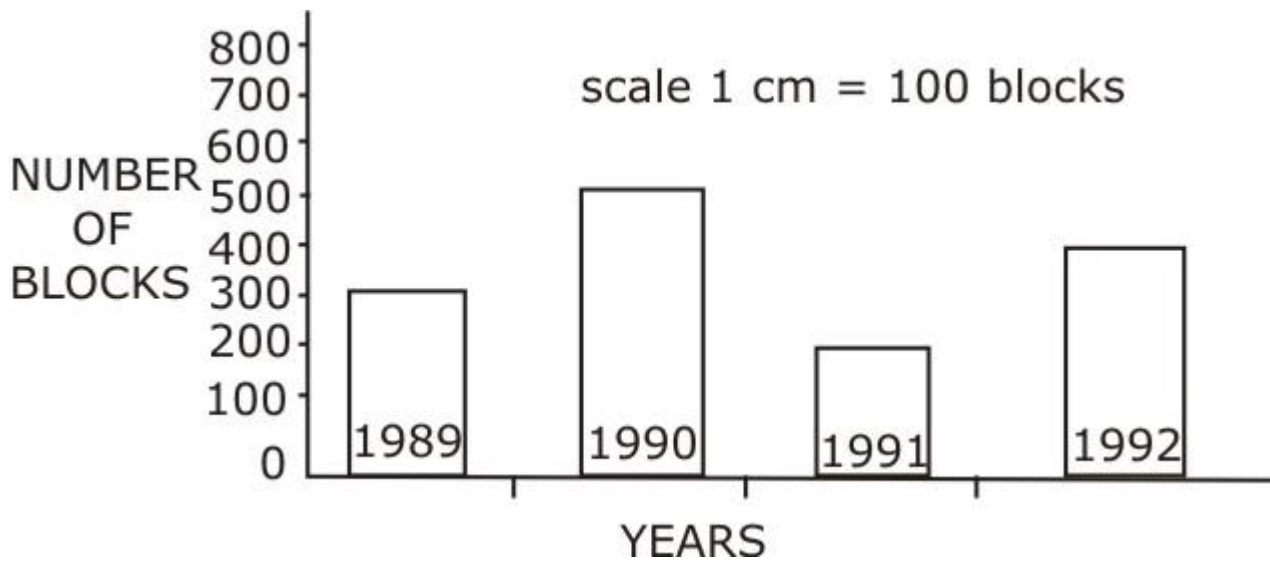
Q 32 There are 30 cards which are numbered from 1 to 30. What is the probability of getting a card having prime number if a card selected at random?

Q 33 What is the probability of getting head if a coin is thrown once?

Q 34 If a dice is thrown, what is the probability of getting an even number?

Q 35 Read the bar graph and answer the following question:

In which year were 200 books sold?



- (a) 1989
(c) 1992

- (b) 1991
(d) 1990

4. Simple Equations

Q 1 Laxmi takes away 7 from 5 times of the number, the result is 13. Then the find the number.

Mark (1)

Q 2 Check whether $x = 8$ is a solution to the equation $x - 8 = 1$.

Mark (1)

Q 3 Write the following statement in the form of equation. 11 is taken away from 3 times of x and the result is 22.

Mark (1)

Q 4 Convert to statement form $x - 4 = 5$.

Mark (1)

Q 5 Find the measure of each angle of an equilateral triangle.

Mark (1)

Q 6 Form an equation if subtract 3 from a number, the result is 4.

Mark (1)

Q 7 Form an equation if on adding 3 to a number the result is 4.

Mark (1)

Q 8 Find x from the equation $x - 2 = 1$.

Mark (1)

Q 9 Find m from the equation $\frac{-m}{3} = 2$.

Mark (1)

Q 10 Solve $2x = 2$.

Mark (1)

Q 11 Find the values of p if $2p - 1 = 23 + p$.

Mark (1)

Q 12 Solve $3n + 15 = 37$.

Marks (2)

Q 13 Solve the equation, $3x + 5 = 11$ by trial and error method.

Marks (2)

Q 14 Check whether $x = -2$ is a solution to the equation $7x + 5 = 9$ or not.

Marks (2)

Q 15 The sum of 2 consecutive integers is 11. Then find the greatest among them .

Marks (2)

$$\frac{x+1}{6} - \left(\frac{7-x}{3} - \frac{1}{4} \right) = \frac{5x-2}{12}$$

Q 16 Solve:

Marks (3)

Q 17 Two-third of a number is 3 more than one-third of the number. Find the number.

Marks (3)

$$2x - \frac{1}{3} = \frac{1}{6} - x$$

Q 18 Solve:

Marks (3)

Q 19 The length of a rectangular field is twice its breadth. If the perimeter of the field is 150 m, find its length and breadth.

Marks (3)

Q 20 Twice a number when decreased by 7 gives 45. Find the number.

Marks (3)

$$2(x-2) + 3(4x-1) = 0$$

Q 21 Solve

Marks (3)

Q 22 Solve the following equations:

(i) $2y + 5/2 = 37/2$,

(ii) $(5x)/2 = 25/2$,

(iii) $6z + 10 = -2$,

(iv) $(a/4) + 7 = 5$.

Marks (4)

Q 23 Two supplementary angles differ by 10° . Find the measures of the two angles.

Marks (4)

Q 24 Solve:

a) $0.5x - (0.8 - 0.2x) = 0.2 - 0.3x$

b) $\frac{x+2}{x-2} = \frac{7}{3}$

Marks (4)

Q 25 If two Complementary angles differ by 10° then find the angles.

Marks (4)

Q 26 Solve the following equations:

- (i) $2y+5/2=37/2$ (ii) $(5x)/2=25/2$,
(iii) $6z+10=-2$, (iv) $(a/4)+7=5$.

Marks (4)

Q 27 Five years ago a man was seven times as old as his son. Five years hence the father would be three times as old as his son. Find their present ages.

Marks (5)

Q 28 In an examination, Radha requires 40% of the total marks to pass. If she gets 175 and fails by 25 marks, what was the total marks?

Marks (5)

Most Important Questions

Q 1 Form an equation for: add 3 to a number so that the result is 4.

Q 2 Convert to statement form ' $x - 4 = 5$ '.

Q 3 Which of the following is correct? Choose the answer from the code given below:

I. The sum of numbers x and 4 is 9.

In equation form, it is represented as $x + 4 = 9$

II. Seven times M plus 7, you get 77.

In equation form, it is represented as $7M + 7 = 77$

III. If you add 3 to one third of Z, you get 30.

$$3 + \frac{Z}{3} = 30$$

In equation form, it is represented as

Code:

- (a) I and II (b) II and III
(c) All are correct (d) All are incorrect

Q 4 What are the values of p and m if $3p - 1 = 23$ and $6m - 2 = 34$

- (a) $p = 6, m = 7$ (b) $p = 8, m = 6$
(c) $p = 6, m = 6$ (d) $p = 4, m = -6$

Q 5 Which of the following is correct?

$$7m + \frac{19}{2} = 13, \text{ then } m = \frac{1}{2}$$

- I.
II. $5t + 28 = 3$, then $t = -5$
III. $5x - 2 = 8$, then $x = 3$

Code :

- (a) I, III (b) II & III
(c) I & II (d) All are correct

Q 6 The solution of $3(b + 2) - (b - 8) = 3(b + 8)$ is

- (a) -10 (b) 10
(c) 2 (d) -3

Q 7 When I subtract 7 from twice a number, the result was 9. What is the equation form?

- (a) $7x - 2 = 9$ (b) $9x - 2 = 7$
(c) $2x - 7 = 9$ (d) $2x - 9 = 7$

Q 8 Is $3x + 5 = 14$ same as $14 = 3x + 5$?

Q 9 $x = 5$ is the solution of $4x + 5 = 65$. (Yes/No)

Q 10 Ravi has 24 rupees in his piggy bank. How much money does he need to buy a book that cost rupees 50?

Q 11 Check whether the value given in the brackets is a solution to the given equation or not:

- (a) $6p - 4 = 8$ ($p = 2$)
(b) $3x + 6 = 15$ ($x = 4$)
(c) $7n - 7 = 0$ ($n = 1$)

Q 12 Solve the following equations:

- (i) $2x + 5 = 13$
(ii) $p - 2 - 3 + (p/2)$
(iii) $6x + 5 = 2x - 7$
(iv) $5(2x - 1) = 14 - 3(x + 2)$

Q 13 Construct 2 equations starting with $x = 3$.

Q 14 The sum of 3 consecutive even numbers is 78. Find the numbers.

Q 15 A number increased by 9 gives 43. Find the number.

Q 16 A number exceeds the other number by 16. The sum of the two numbers is 120. Find the numbers.

Q 17 Laxmi takes away 7 from $(5/2)$ of the number, the result is $(11/2)$. Then the number is

- (a) $(11/2)$ (b) $(5/2)$ (c) 11 (d) 5

Q 18 Student has to secure 35% marks to pass. He got 80 marks and failed by 60 marks. Find the maximum marks.

- (a) 100 (b) 200
(c) 300 (d) 400

Q 19 There were only two candidates who participated in an election. One contestant got 62% votes and was elected by a margin of 144 votes. The total numbers of votes were

- (a) 500 (b) 600
(c) 700 (d) 800

Q 20 In a coconut grove, $(x + 2)$ trees yield 60 nuts per year, x trees yield 120 nuts per year and $(x - 2)$ trees yield 180 nuts per year. If the average yield per year of all trees be 100, then find x .

- (a) 4 (b) 3
(c) 2 (d) 1

Q 21 There are 650 students in a school. If the number of girls is 106 more than the boys, how many boys are there in the school?

Q 22 A man is thrice as old as his son. After 12 years, he will be twice as old as his son. Find their present ages.

Q 23 Vidya's mother's age is 5 years more than the three times of Vidya's present age. Find Vidya's present age, if her mother is 44 years old.

- (a) 10 years (b) 16 years
(c) 13 years (d) 18 years

Q 24 The sum of four times a number and 12 is 36. Find the number?

- (a) 7 (b) 4
(c) 6 (d) 5

Q 25 Sachin says that he has 6 books more than the 6 times of the books Priyanka has. Sachin has 42 books. How many books does Priyanka have?

- (a) 8 (b) 6
(c) 9 (d) 10

Q 26 The teachers tell the class that the lowest marks obtained by a student in her class are one-fourth the highest marks plus 8 is 33. What is the highest score?

- (a) 90 (b) 100
(c) 60 (d) 200

Q 27 The average of 11, 12, 13, 14 and x is 13. The value of x is

- (a) 17 (b) 21
(c) 15 (d) 23

5. Lines and Angles

Q 1 Find the supplementary angle of 75° .

Mark (1)

Q 2 State true or false : If Line $AB \parallel DE$ and FG is transversal, sum of two interior angles on the same side of transversal is less than 180° .

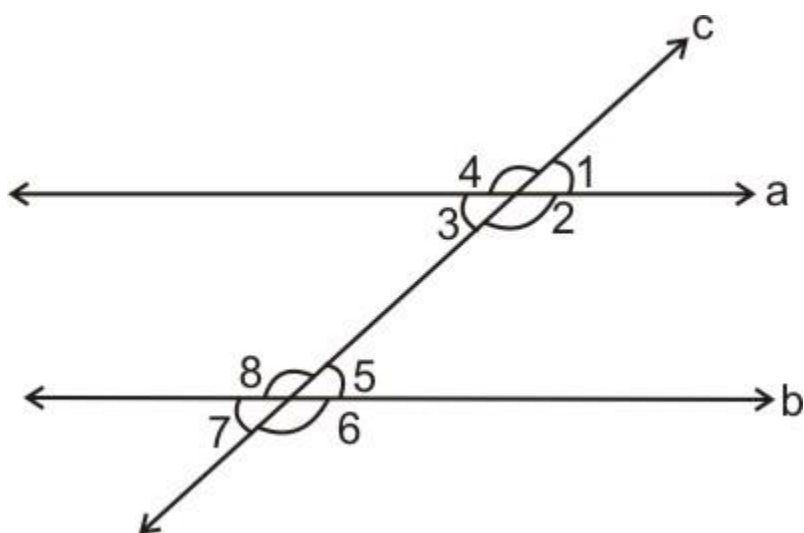
Mark (1)

Q 3 Fill in the blank :

An Angle is formed by the intersection of_____.

Mark (1)

Q 4 In the figure, identify the pairs of corresponding angles.



Mark (1)

Q 5 An angle is greater than 45° . Will its complement be an angle greater than 45° or equal to 45° or less than 45° ?

Mark (1)

Q 6 Find the complement of 70° .

Mark (1)

Q 7 Define adjacent angles.

Mark (1)

Q 8 State true or false: If measure of an angle is 90° then its supplement angle will be greater than 90° .

Mark (1)

Q 9 State true or false: Two obtuse angles form a linear pair.

Mark (1)

Q 10 State true or false: Two acute angles form a linear pair. Mark (1)

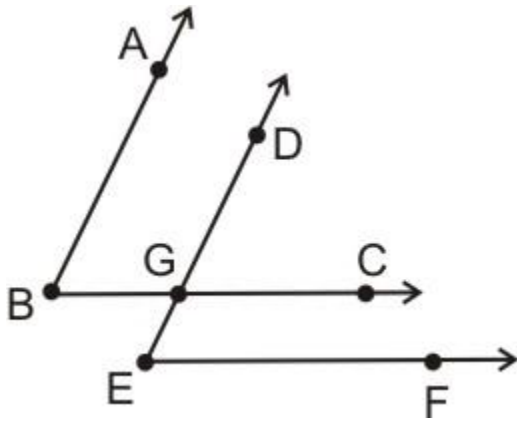
Q 11 Fill in the blank : If two adjacent angles are complementary they form a _____

Mark (1)

Q 12 In the figure, the arms of two angles are parallel. If $\angle ABC = 70^\circ$, then find

(i) $\angle DGC$

(ii) $\angle DEF$

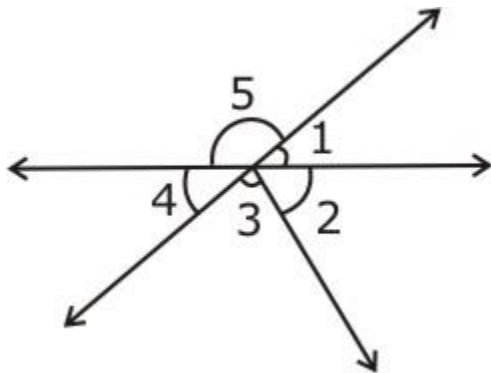


Marks (2)

Q 13 Indicate two pairs of angles which are:

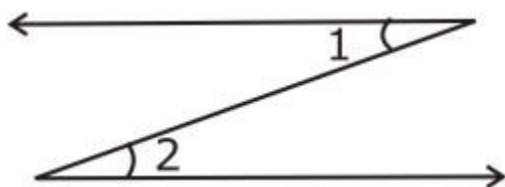
(i) vertically opposite angles.

(ii) linear pairs.



Marks (2)

Q 14 In the following figure, is $\angle 1$ adjacent to $\angle 2$? Give reason.

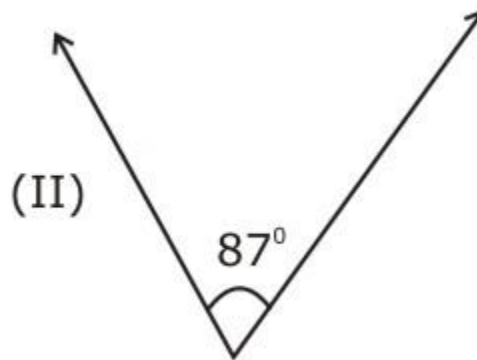
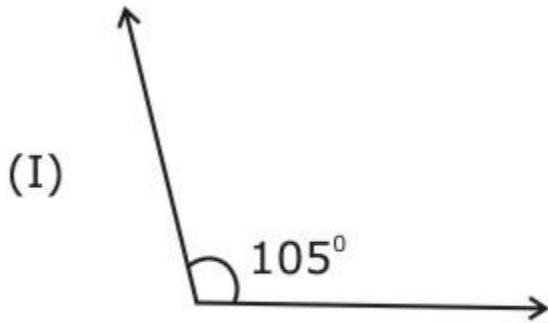


Marks (2)

Q 15 (i) Find the angle, which is equal to its complement.(ii) Find the angle, which is equal to its supplement.

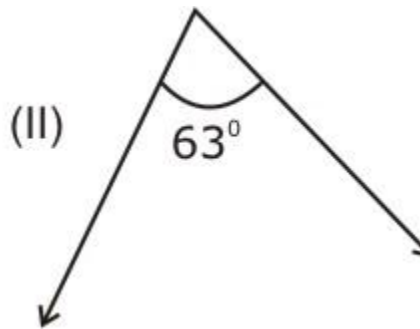
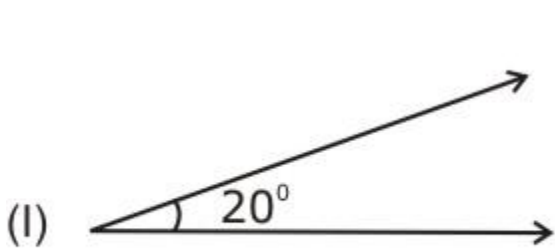
Marks (2)

Q 16 Find the supplement of the following angles:



Marks (2)

Q 17 Find the complement of the following angles.

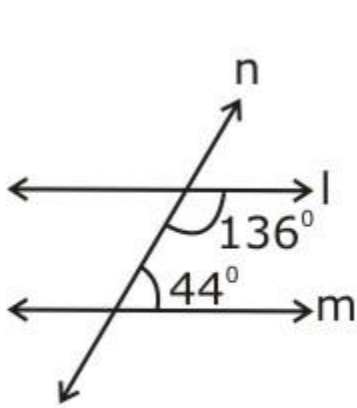


Marks (2)

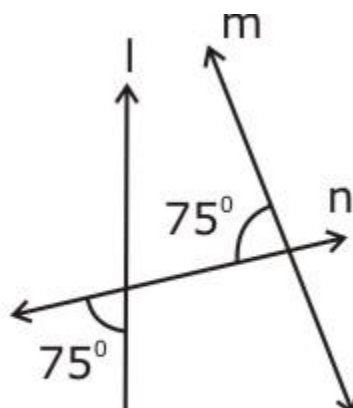
Q 18 If an angle is equal to its complementary angle ,find the measure of that angle?

Marks (2)

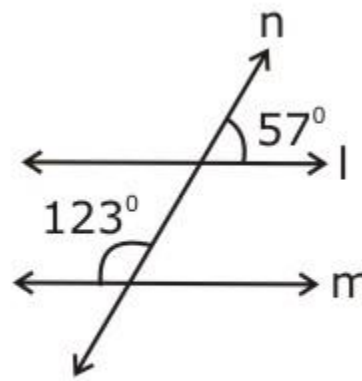
Q 19 In the given figure, decide whether l is parallel to m :



(i)



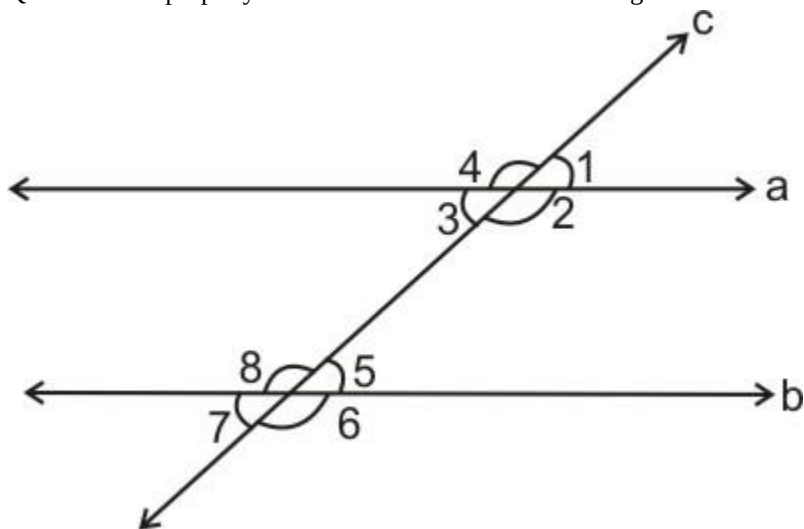
(ii)



(iii)

Marks (3)

Q 20 State the property that is used in each of the following statements:



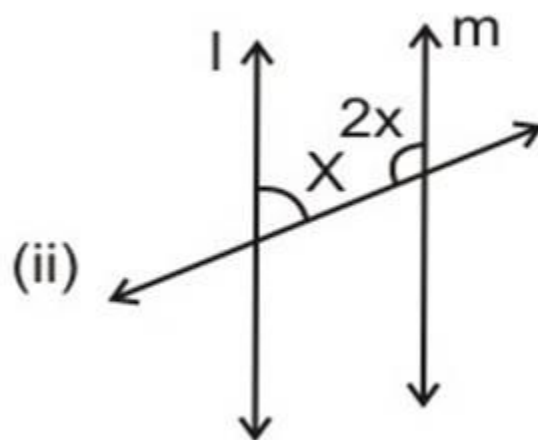
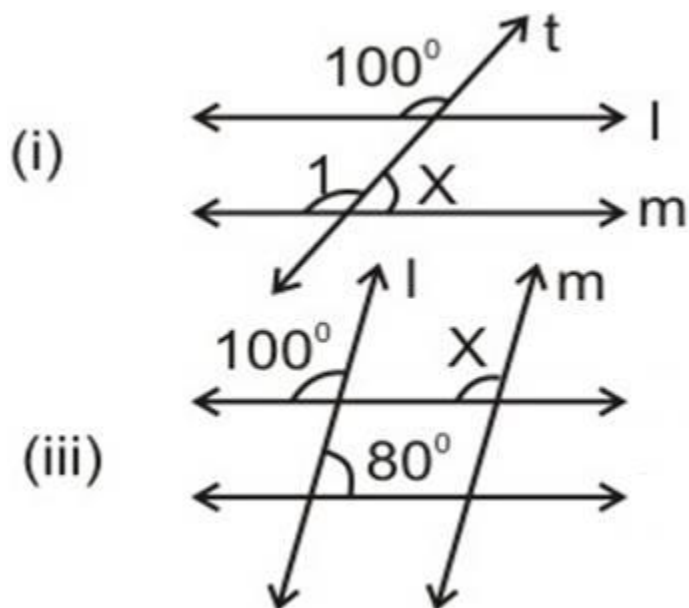
(i) If $a \parallel b$, then $\angle 1 = \angle 5$.

(ii) If $\angle 4 = \angle 6$, then $a \parallel b$.

(iii) If $\angle 2 + \angle 5 = 180^\circ$, then $a \parallel b$.

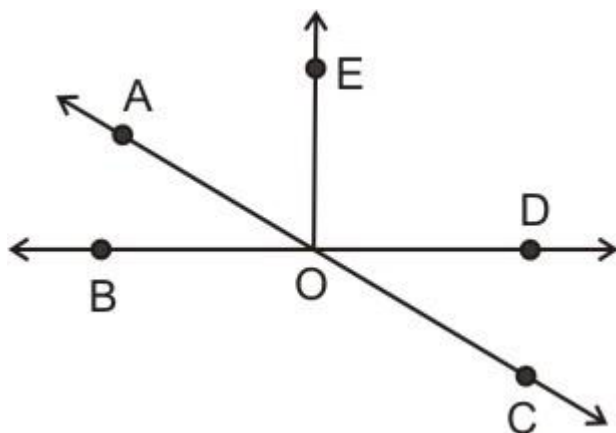
Marks (3)

Q 21 Find the value of x in each of the following figure if $l \parallel m$.



Marks (4)

Q 22 In the adjoining figure, name the following pairs of angles:



- (i) Obtuse vertically opposite angles
- (ii) Adjacent complement angles
- (iii) Equal supplementary angles
- (iv) Unequal supplementary angles
- (v) Adjacent angles that do not form a linear pair.

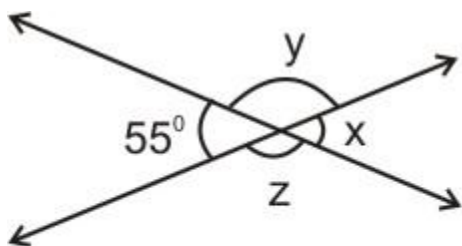
Marks (5)

Q 23 Fill in the blanks:

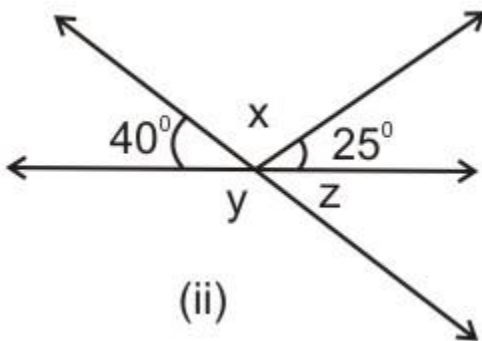
- (1) If two angles are complementary then the sum of their measures is _____
- (2) If two angles are supplementary then the sum of their measures is _____
- (3) Two angles forming a linear pair are _____.
- (4) If two adjacent angles are supplementary, then they form a _____
- (5) If two lines intersect at a point then the vertically opposite angles are always _____

Marks (5)

Q 24 Find the value of the angles x , y and z in each of the following figures:

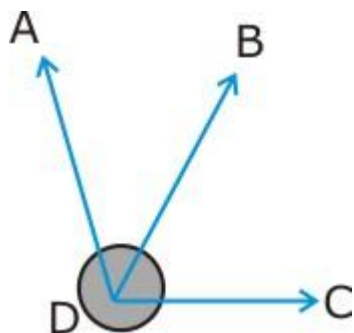


(i)



(ii)

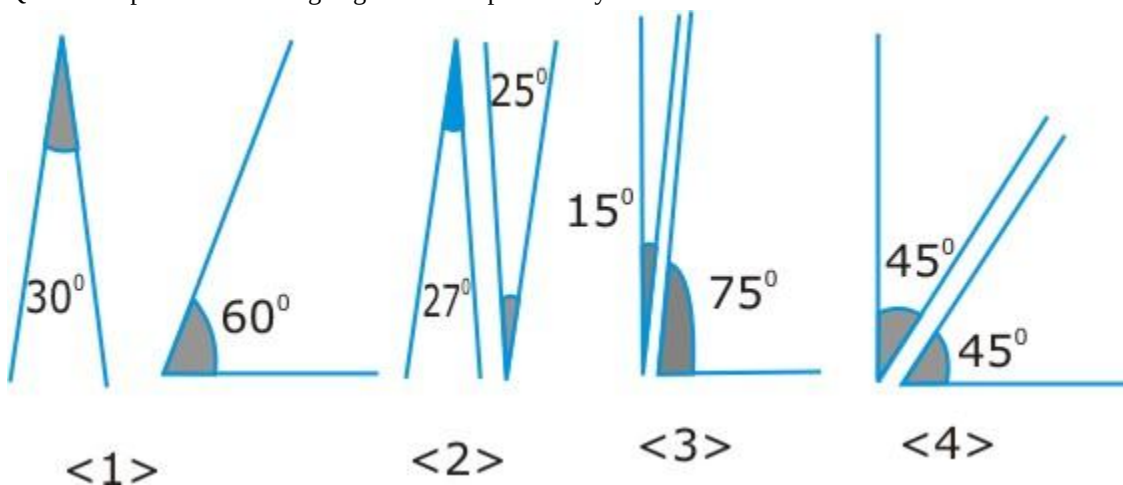
Marks (5)



Q 1 Name all angle shown in the figure.

Q 2 An angle is formed when two line segments or two rays have a common_____.

Q 3 Which pairs of following angles are complementary?



Q 4 Identify which of the following pairs of angles are complementary?

(a) 71° and 21° (b) 71° and 19° (c) 69° and 21° (d) 33° and 58° (e) 33° and 57° (f) 43° and 47° .

Q 5 Which one of the following shows the sum of two complementary angles?

(1) 85° (2) 90° (3) 95° (4) 80°

Q 6 What is the measure of the complement of each of the following angles?

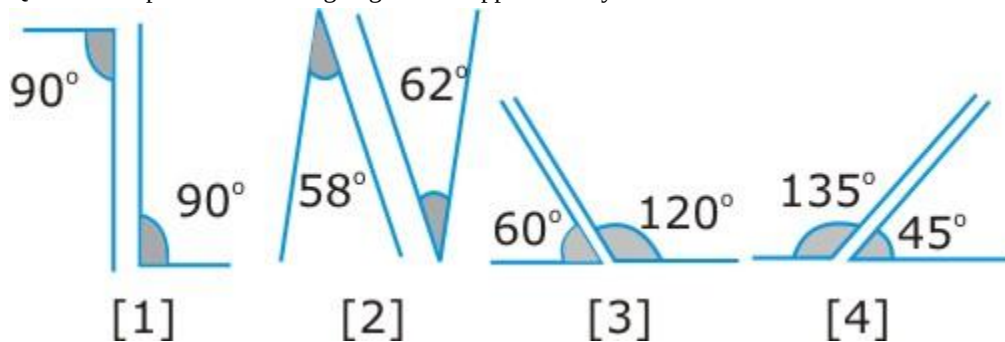
(a) 35° (b) 85° (c) 51° (d) 64°

Q 7 The difference in the measures of two complementary angles is 12° . Find the measures of the angles.

Q 8 Find the angle, which is equal to its complement.

Q 9 An angle is greater than 45° . Is its complementary angle greater than 45° or equal to 45° or less than 45° ?

Q 10 Which pairs of following angles are supplementary?



Q 11 Identify which of the following pairs of angles are supplementary?

(a) 60° and 120° (b) 35° and 145° (c) 133° and 57° (d) 91° and 89°

Q 12 Which one of the following is the sum of two supplementary angles?

(1) 85° (2) 180° (3) 95° (4) 80°

Q 13 What is the measure of the supplement of each of the following angles?

(a) 11° (b) 22° (c) 111° (d) 122°

Q 14 The difference in the measures of two supplementary angles is 30° . Find the measures of the angles.

Q 15 Find the angle, which is equal to its supplementary.

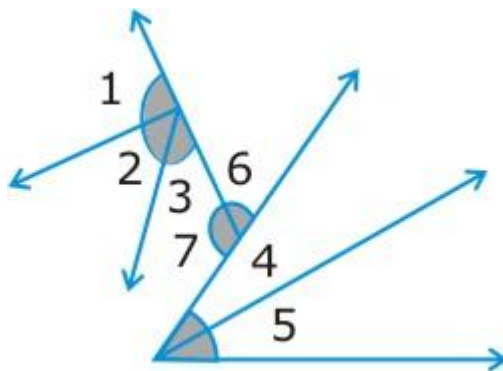
Q 16 An angle is less than 90° . Is its supplementary angle greater than 90° or equal to 90° or less than 90° ?

Q 17 Fill in the blanks.

(a) Adjacent angles have a common _____.

(b) Adjacent angles have a common _____.

(c) In adjacent angles the non-common arms are on either side of the _____.

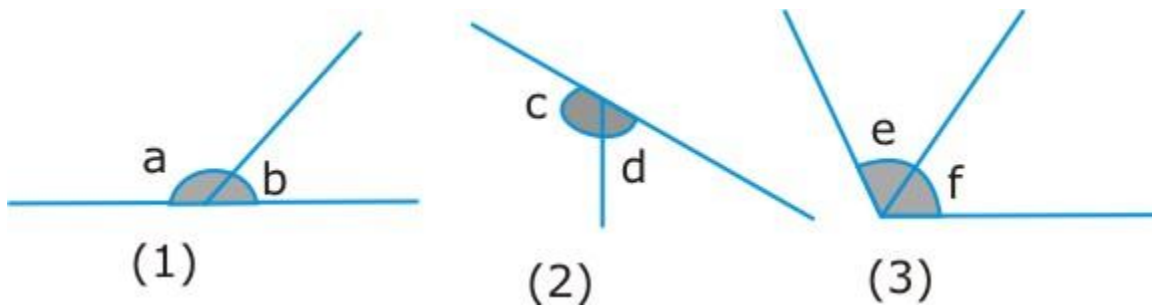


Q 18 Which of the angles are adjacent angles?

Q 19 Fill in the blank...

A linear pair is a pair of adjacent angles whose non-common sides are _____.

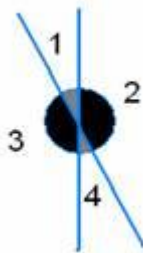
Q 20 Which of the angles is linear pair?



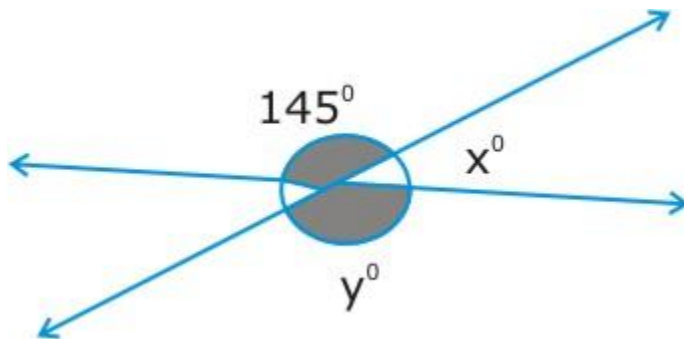
Q 21 Which one is the sum of linear pair angles?

(a) 80° (b) 90° (c) 180° (d) 360° .

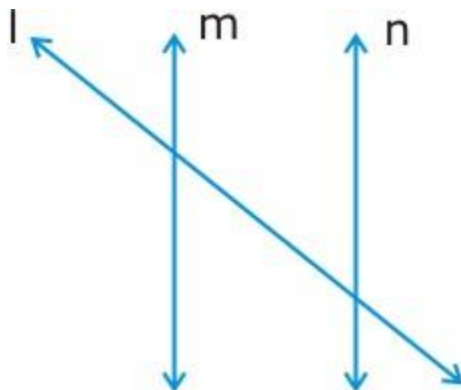
Q 22 Name all pairs of vertically opposite angles of the figure.



Q 23 Calculate the value of x° and y° .

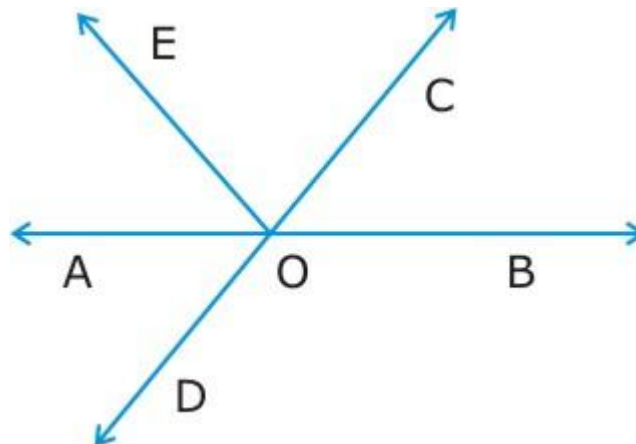


Q 24 Name the pair of intersecting lines in the figure.



Q 25 In Fig identify:

- (i) Five pairs of adjacent angles.
- (ii) Three linear pairs.



- (iii) Two pairs of vertically opposite angles.

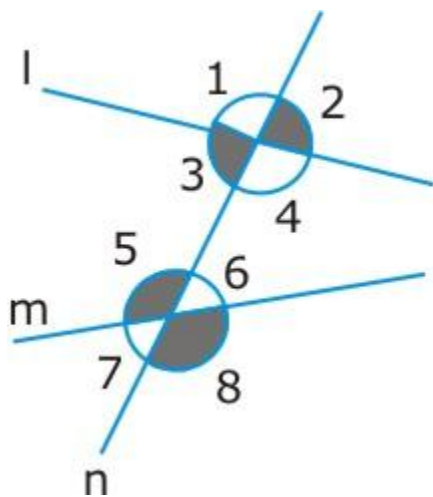
Q 26 Fill in the blank.

Two lines l and m intersect if they have a point in common. This common point O is their point of _____.

Q 27 Fill in the blanks.

A line that intersects two or more lines at _____ (1) _____ is called a _____ (2) _____.

Q 28 Fill in the blanks.



- ☐ In the given figure angles 3,4,5,6 are called _____.
- ☐ In the given figure angles 1,2,7,8 are called _____.

Q 29 In the fig no.1 name all pairs of Corresponding angles.

Q 30 In the fig no.1 name all pairs of Alternate interior angles.

Q 31 In the fig no.1 name all pairs of Alternate exterior angles.

Q 32 In the fig no.1 name all pairs of interior angles on the same side of the transversal.

Q 33 Fill in the blanks.

- (a) If two parallel lines are cut by a transversal, each pair of corresponding angles is _____ (1) _____ in measure.
- (b) If two parallel lines are cut by a transversal, each pair of alternate interior angles is _____ (2) _____.

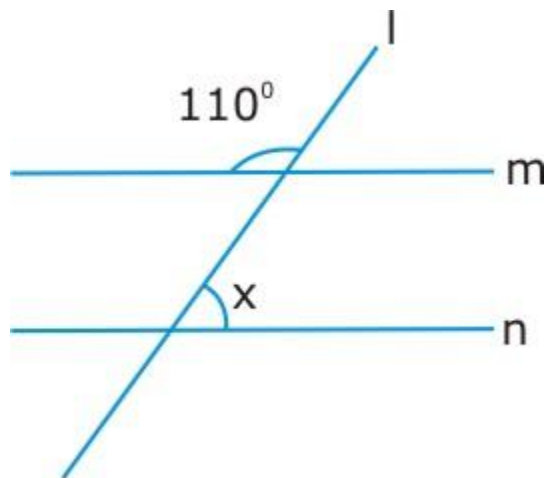
Q 34 Which shape is relevant to the corresponding angle?

(a) X- shape (b) Y-shape (c) F-shape (d) Z-shape.

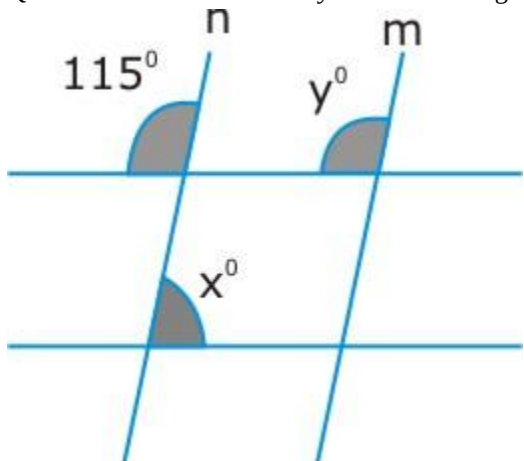
Q 35 Which shape is relevant to the alternate angle?

(a) X- shape (b) Y-shape (c) F-shape (d) Z-shape.

Q 36 Find the value of x in the following figure if $n \parallel m$.



Q 37 Find the value of x and y in the following figure if $n \parallel m$.



6. The Triangle and its Properties

Q 1 Is the triangle possible, if sides of the triangle are 5 cm, 12 cm and 6 cm?

Mark (1)

Q 2 Is the triangle possible if angles of the triangle are 30° , 60° and 80° ?

Mark (1)

Q 3 Fill in the blank:

If in a triangle Pythagoras property holds, the triangle must be _____.

Mark (1)

Q 4 Fill in the blank :

Exterior angle of a triangle is always equal to sum of two _____.

Mark (1)

Q 5 Define the median of a triangle.

Mark (1)

Q 6 Fill in the blank :

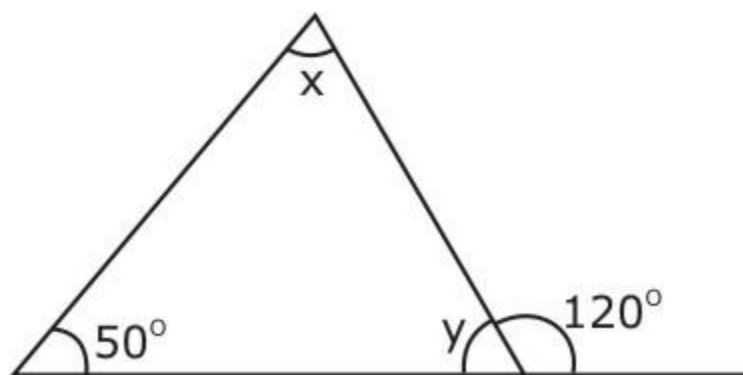
Sum of three angles of a triangle is equal to _____.

Mark (1)

Q 7 $\triangle ABC$ is right-angled at C. If $AC = 5$ cm and $BC = 12$ cm find the length of AB.

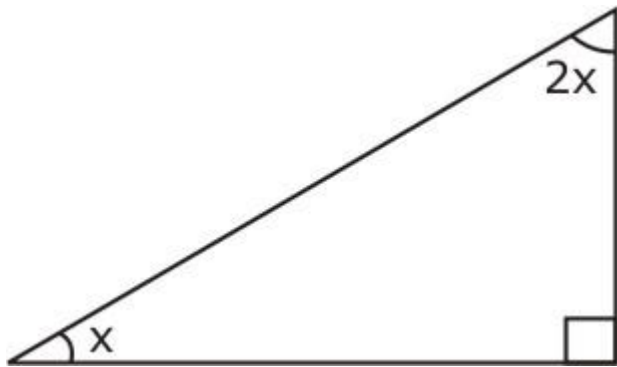
Marks (2)

Q 8 Find angles x and y in the following figure:



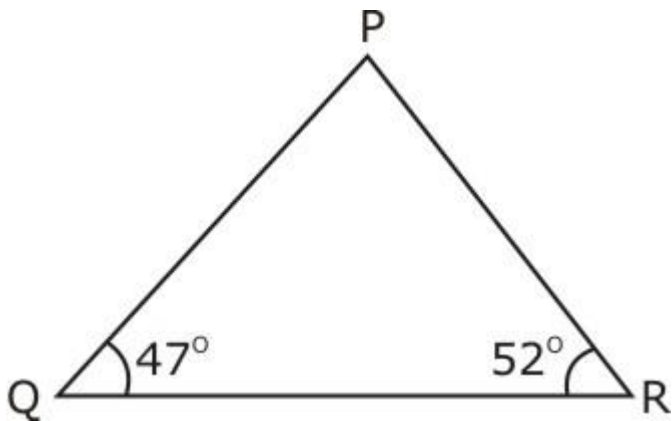
Marks (2)

Q 9 Find angle x in the following figure:



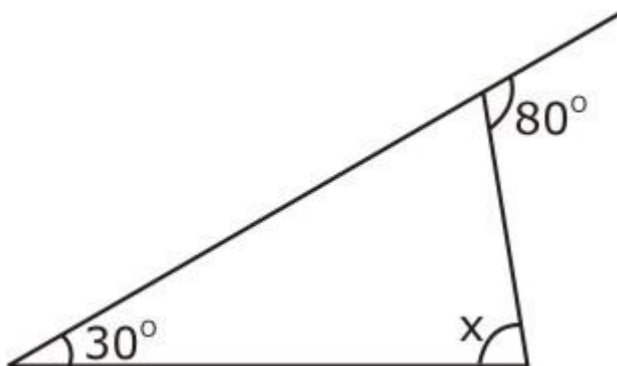
Marks (2)

Q 10 In the given figure, find $m\angle P$.



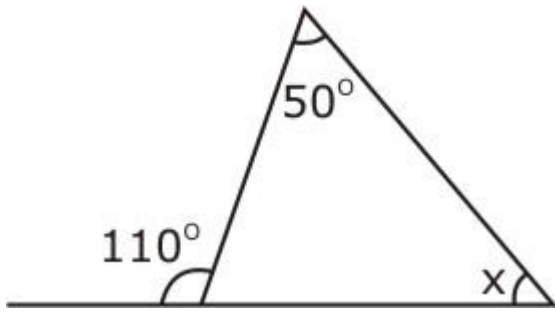
Marks (2)

Q 11 Find the measure of x in the following figure:



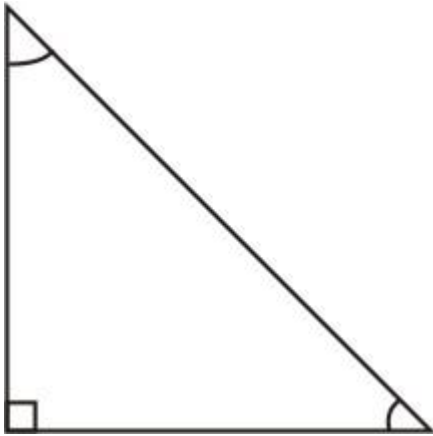
Marks (2)

Q 12 Find angle x in the figure given below:



Marks (2)

Q 13 In a right-angled triangle if two angles other than right angle are equal. Find all the angles of the triangle.



Marks (2)

Q 14 Find the measure of each angle of an equilateral triangle.

Marks (2)

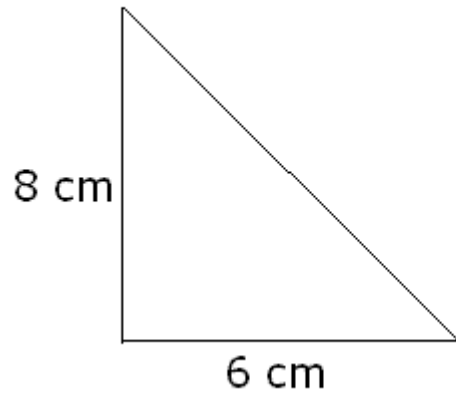
Q 15 If in a right angle isosceles triangle area is 32 cm^2 . Find the sides of the triangle.

Marks (2)

Q 16 A 15 m long ladder reached a window 12 m high from the ground on placing it against a wall at a distance a metre from the wall. Find the distance of the foot of the ladder from the wall.

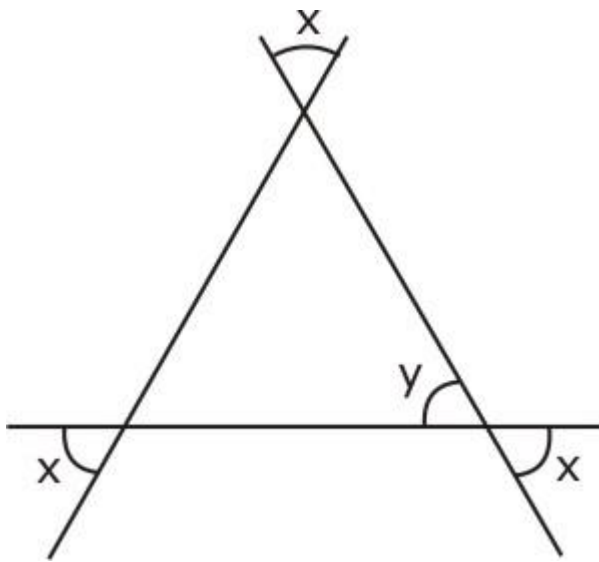
Marks (3)

Q 17 The lengths of two sides of a triangle are 6 cm and 8 cm. Between which two numbers can length of the third side fall?



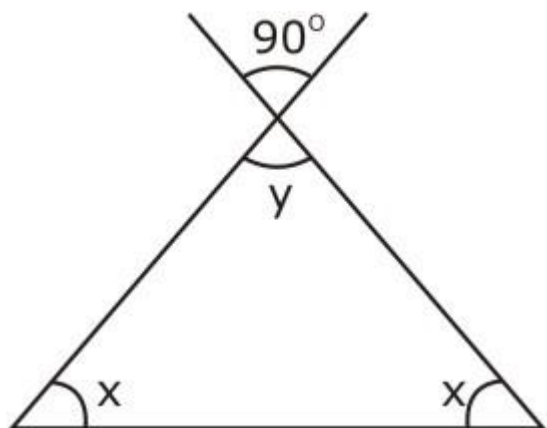
Marks (3)

Q 18 Find angles x and y in the following figure:



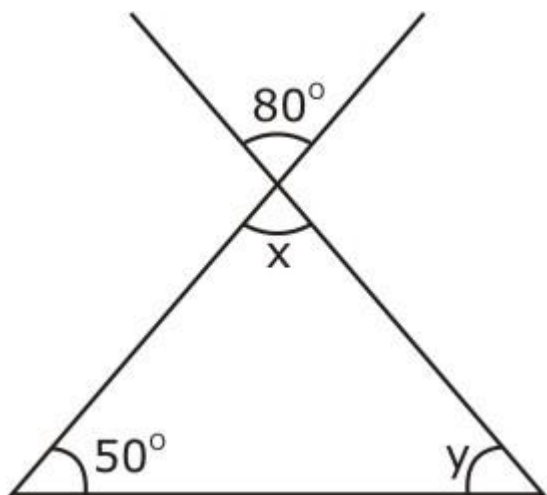
Marks (3)

Q 19 Find angles x and y in the following figure:



Marks (3)

Q 20 Find angles x and y in the following figure:



Marks (3)

Q 21 The three angles of a triangle are in the ratio 1:2:1. Find all the angles of the triangle. Classify the triangle in two different ways.

Marks (4)

Q 22 A tree is broken at a height of 12 m from the ground and its top touches the ground at a distance of 5 m from the base of the tree. Find the original height of the tree.

Marks (4)

Q 23 The diagonals of a rhombus measure 10 cm and 24 cm. Find its perimeter.

Marks (4)

Q 24 A 13 m long ladder reached a ventilator 12m high from the ground on placing it against a wall at a distance. Find the distance of the foot of the ladder from the wall.

Marks (4)

Q 25 In triangle PQR, PS is median. Show that $PQ + QR + RP > 2PS$.

Marks (4)

Q 26 A tree is broken at a height of 5 m from the ground and is bent so that its top touches the ground at a distance of 12 m from the base of the tree. Find the original height of the tree.

Marks (5)

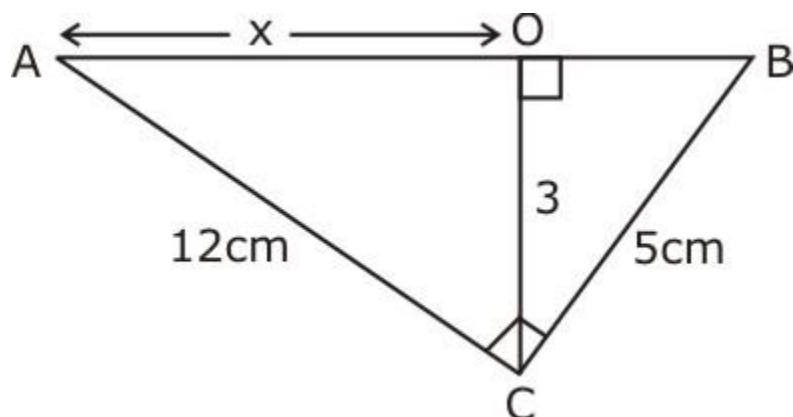
Q 27 The diagonals of a rhombus measure 24 cm and 10 cm. Find its perimeter.

Marks (5)

Q 28 Find the perimeter of a rectangle whose length is 40 cm and the length of one of the diagonal is 41 cm.

Marks (5)

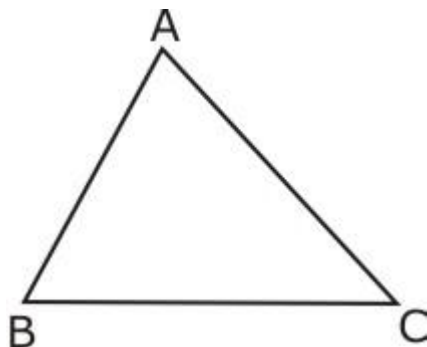
Q 29 In the given figure, triangle ABC is right-angled at C . Find x .



Marks (5)

Most Important Questions

Q 1 In the given triangle ABC answer the following questions:



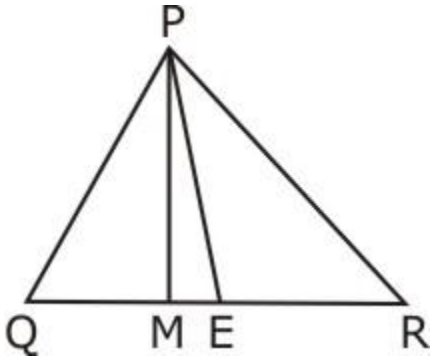
(i) Side opposite to angle B.

(ii) Vertex opposite to Side AC

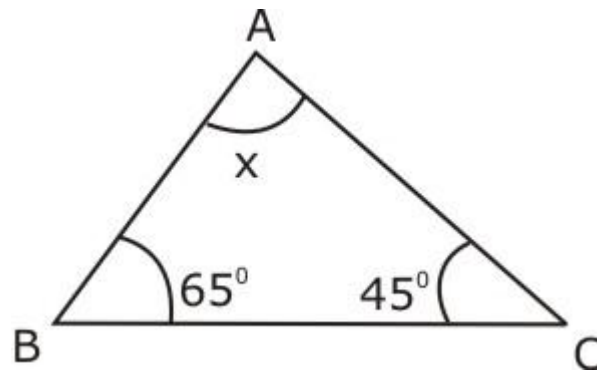
(iii) Angle opposite to side BC.

(iv) All six elements of triangle ABC.

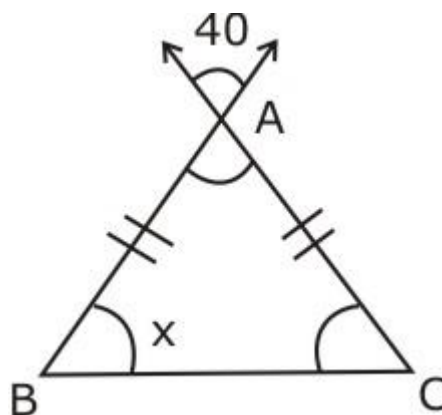
Q 2 In the triangle PQR, E is the mid-point of QR and PM is perpendicular to the side QR; in the given figure answer the following:



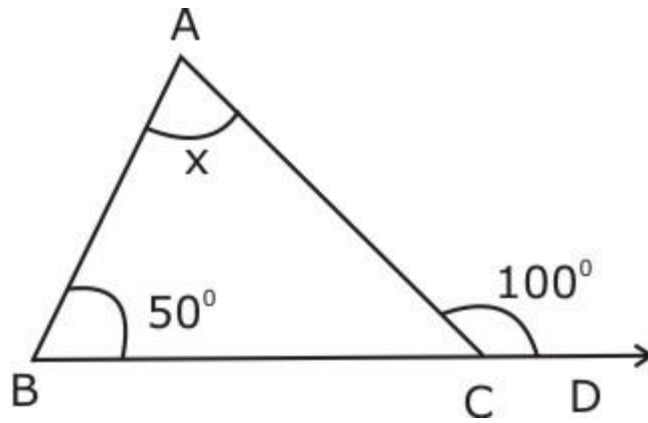
- (i) The altitude of side QR = ...
- (ii) PE = ...
- (iii) Will the altitude of all the sides be the same?
- (iv) How many medians can a triangle have? Do the medians always lie within the triangle?



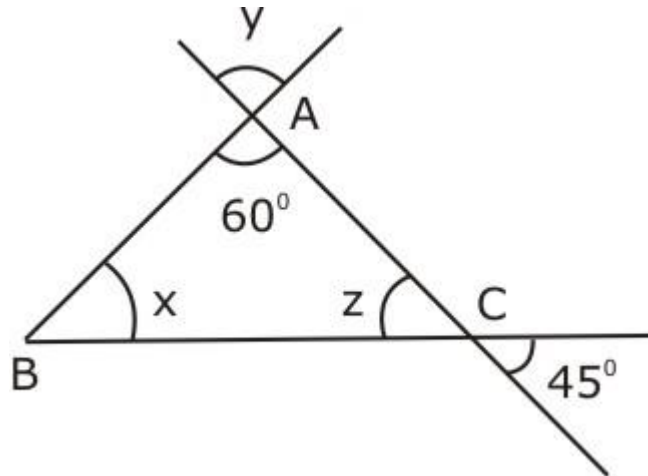
Q 3 In the given triangle find the value of x .



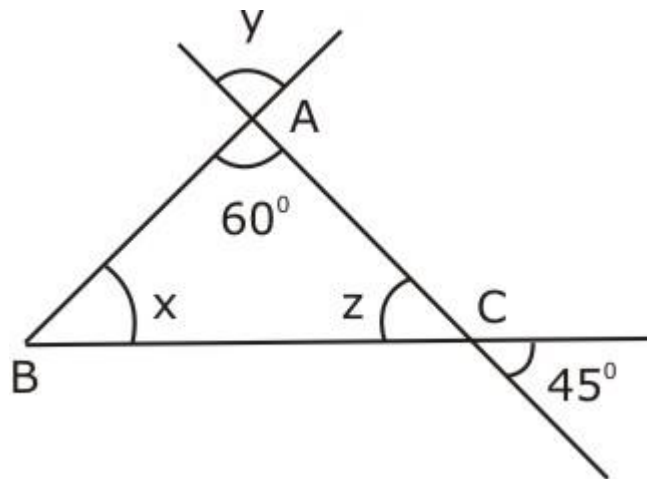
Q 4 In the given figure find the value of x.



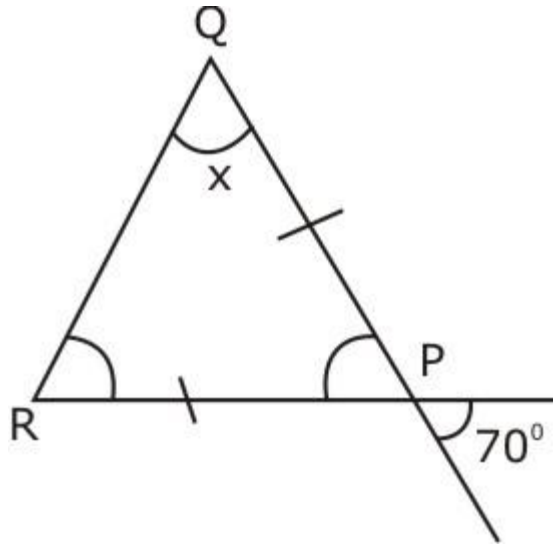
Q 5 Find the value of x , in the given figure



Q 6 In the given figure find the value of x and y .



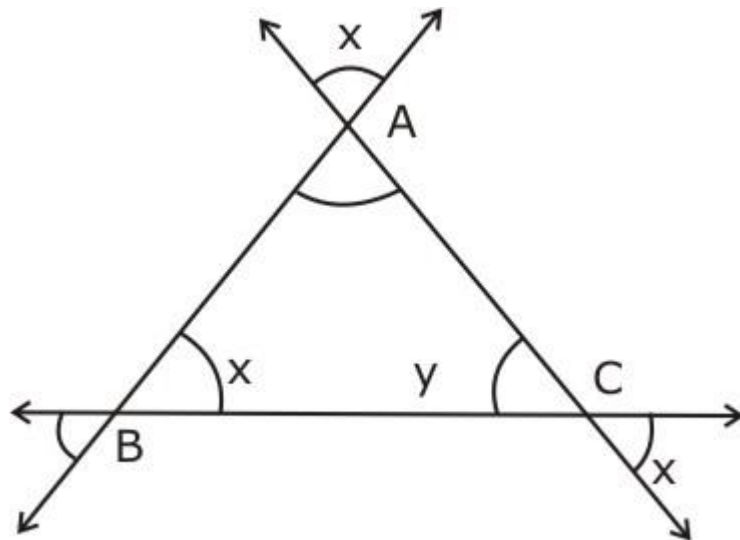
Q 7 In the given figure find the value of x .



Q 8 In the given figure find the value of the unknowns:

Q 9 Define the following :

- a) Altitude
- b) Median
- c) Centroid



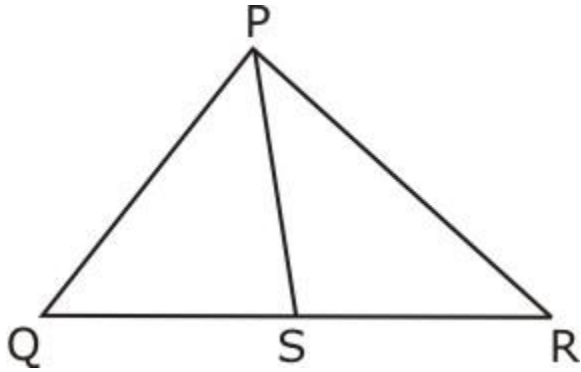
Q 10 In the given figure find the value of x, y and z.

Q 11 Can 6.5 cm, 2.4 cm and 3.5 be the sides of a triangle?

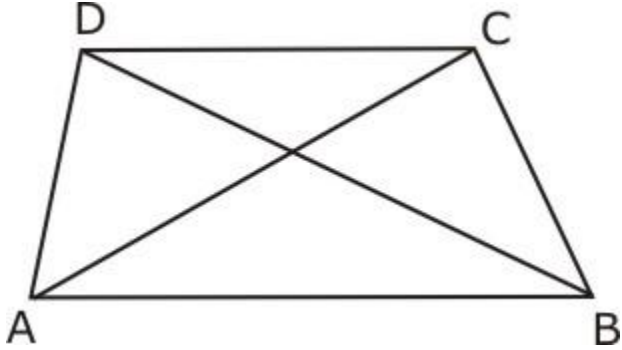
Q 12 Can 5cm, 5cm and 5cm be the sides of a triangle?

Q 13 The length of two sides of a triangle are 12 cm and 15 cm, between what two measures will the length of the third side lie ?

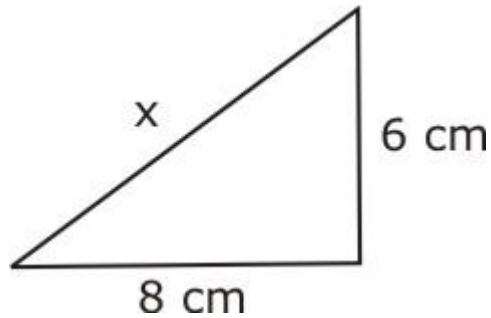
Q 14 In triangle PQR, PS is the median of the triangle, prove that $PQ + QR + RS > 2 PS$



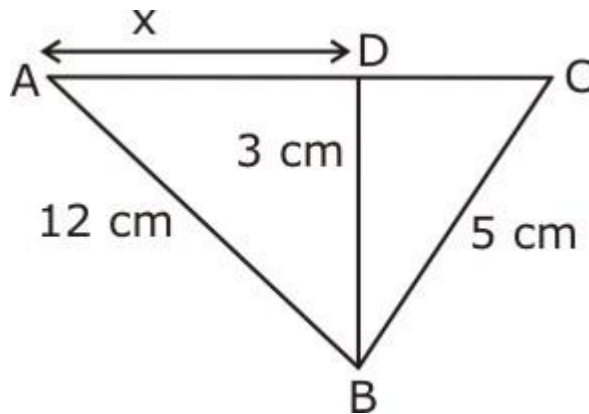
Q 15 In the Quadrilateral ABCD prove that $AB + BC + CD + DA > AC + BD$



Q 16 Determine whether the triangle whose sides are 3 cm, 4 cm and 5 cm are the sides of a right angled triangle or not

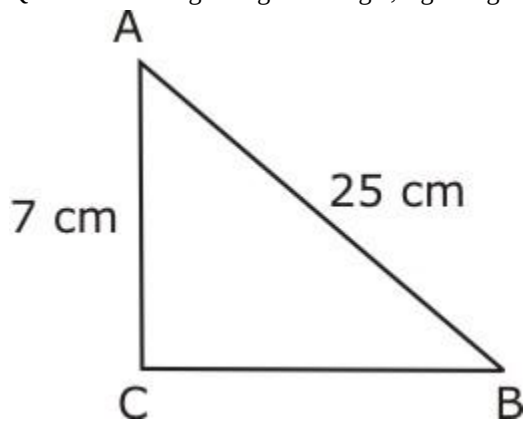


Q 17 Find the value of x in the given figure:

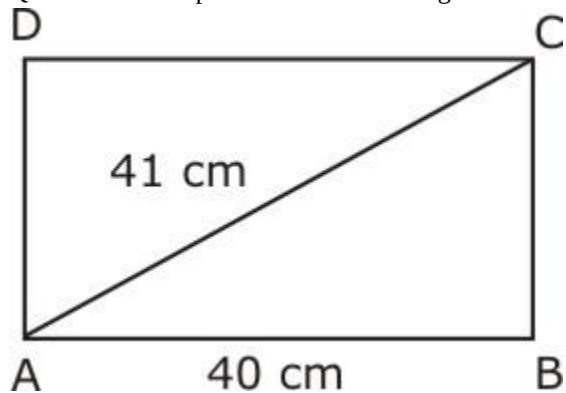


Q 18 In the given figure, find the value of x.

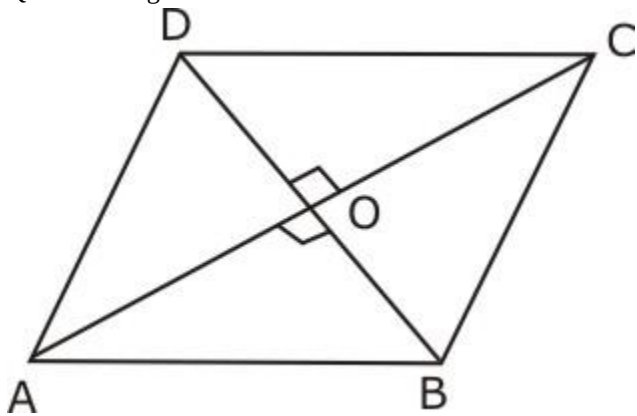
Q 19 ABC is a right-angled triangle, right angled at C. IF AB =25 cm and AC = 7 cm, Find BC.



Q 20 Find the perimeter of the rectangle whose length is 40 cm and one of the diagonal is 41 cm.



Q 21 The diagonals of a rhombus measure 16 cm and 30 cm find the perimeter of the rhombus.



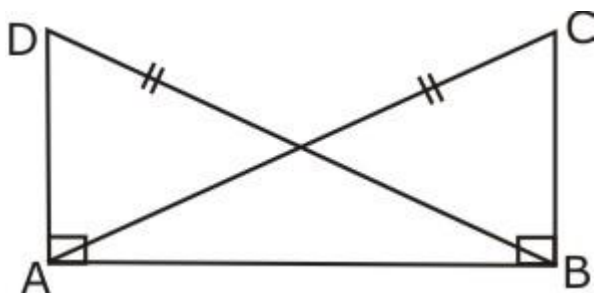
7. Congruence of Triangles

Q 1 Fill in the blank : Two line segments are congruent if _____.

Mark (1)

Q 2 In the following fig. , $DA \perp AB$, $CB \perp AB$ and $AC = BD$. State the three pairs of equal parts in $\triangle ABC$ and $\triangle DAB$. Which of the following statements is meaningful?

- (i) $\triangle ABC \cong \triangle BAD$ (ii) $\triangle ABC \cong \triangle ABD$



Marks (2)

Q 3 If $\triangle DEF \cong \triangle BCA$, write the part that corresponds to

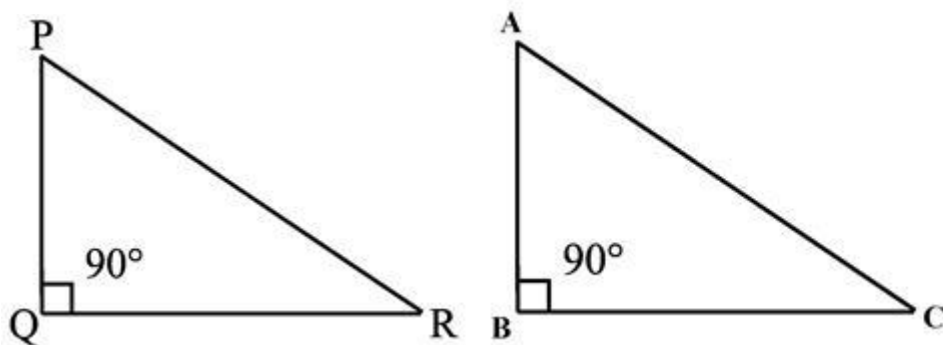
- (i) $\angle E$
 (ii) $\overline{EF}$
 (iii) $\angle F$
 (iv) $\overline{DF}$

Marks (2)

Q 4 If $\triangle ABC \cong \triangle FED$ under the correspondence $ABC \leftrightarrow FED$, write all the corresponding congruent parts of the triangles.

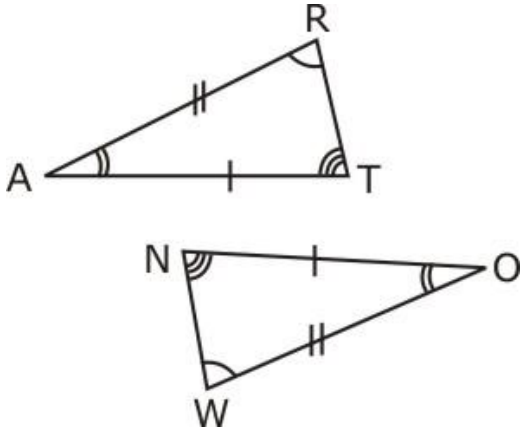
Marks (2)

Q 5 It is to be established by RHS congruence rule that $\triangle ABC \cong \triangle PQR$. What additional information is needed, if it is given that $\angle B = \angle Q = 90^\circ$ and $AC = PR$?



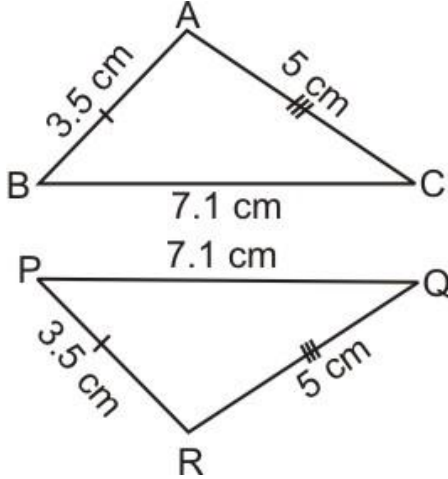
Marks (2)

Q 6 In the figure, the two triangles are congruent. The corresponding parts are marked. Can we write $\triangle RAT \cong \triangle WON$? Give reasons also.



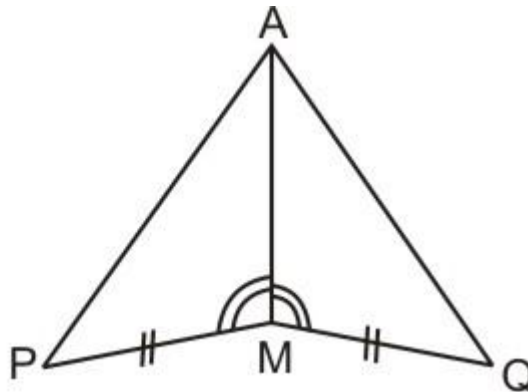
Marks (2)

Q 7 In $\triangle ABC$ and $\triangle PQR$, $AB = 3.5$ cm, $BC = 7.1$ cm, $AC = 5$ cm, $PQ = 7.1$ cm, $QR = 5$ cm and $PR = 3.5$ cm. Examine whether the two triangles are congruent or not. If yes, write the congruence relation in symbolic form.



Marks (2)

Q 8 In fig. given that $PM = QM$ and $\angle PMA = \angle QMA$. Show that $\triangle AMP \cong \triangle AMQ$.



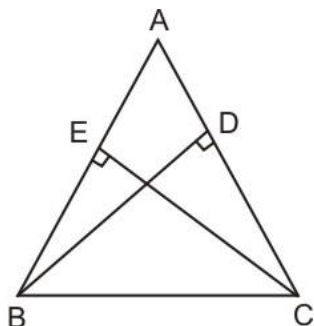
Marks (3)

Q 9 In Fig, BD and CE are altitudes of $\triangle ABC$ such that $BD = CE$.

(i) State the three pairs of equal parts in $\triangle CBD$ and $\triangle BCE$.

(ii) Is $\triangle CBD \cong \triangle BCE$? Why or why not?

(iii) Is $\angle DCB = \angle ECB$? Why or why not?



Marks (3)

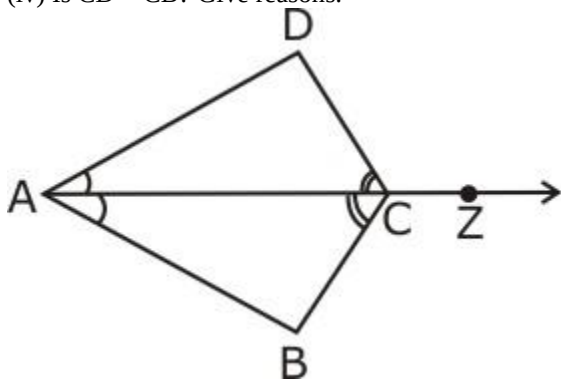
Q 10 In the given fig., ray AZ bisects $\angle DAB$ as well as $\angle DCB$.

(i) State the three pairs of equal parts in triangles BAC and DAC.

(ii) Is $\triangle BAC \cong \triangle DAC$? Give reasons.

(iii) Is $AB = AD$? Justify your answer.

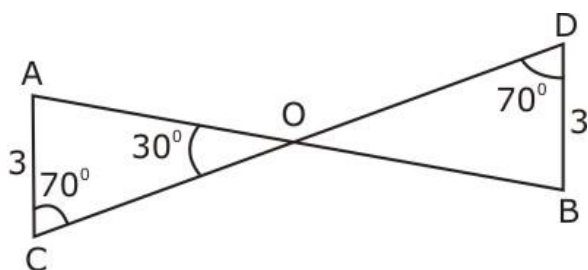
(iv) Is $CD = CB$? Give reasons.



Marks (3)

Q 11 In the given fig. , can you use ASA congruence rule and conclude that

$\triangle AOC \cong \triangle BOD$?



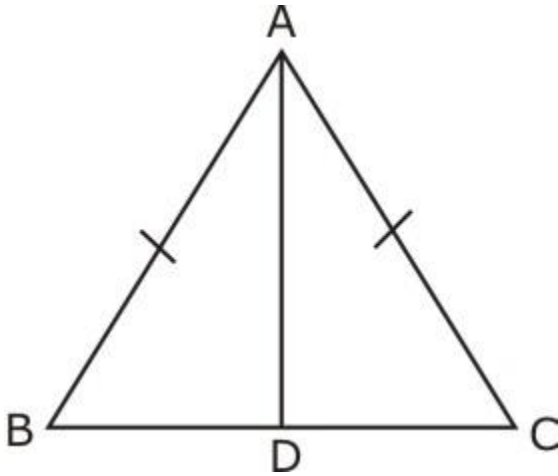
Marks (3)

Q 12 In $\triangle ABC$, $AB = AC$ and AD is the bisector of $\angle BAC$.

(i) State three pairs of equal parts in triangles ADB and ADC .

(ii) Is $\triangle ADB \cong \triangle ADC$? Give reasons.

(iii) Is $\angle B = \angle C$? Give reasons.



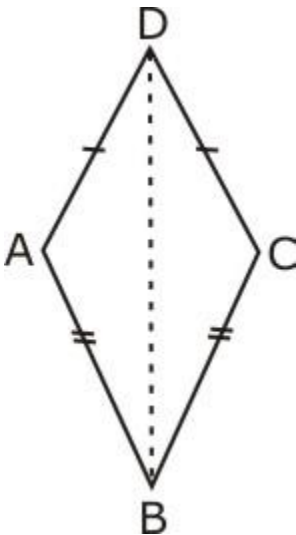
Marks (3)

Q 13 In fig, $AD = CD$ and $AB = CB$.

(i) State the three pairs of equal parts in $\triangle ABD$ and $\triangle CBD$.

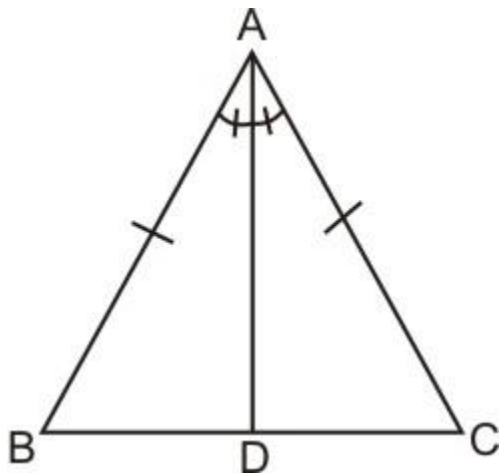
(ii) Is $\triangle ABD \cong \triangle CBD$? Why or why not?

(iii) Does BD bisect $\angle ABC$? Give reasons.



Marks (3)

Q 14 $\triangle ABC$ is isosceles with $AB = AC$ as shown in figure. Line segment AD bisects $\angle A$ and meets base BC in D . Find the third pair of corresponding parts which make $\triangle ADB \cong \triangle ADC$ by SAS congruence condition. Is it true to say that $BD = DC$?



Marks (3)

Q 15 In Quadrilateral ABCD, $AD = BC$, $AB = CD$ and BD is a diagonal, prove that $\triangle ABD \cong \triangle CDB$. State the congruent parts too.

Marks (4)

Q 16 In the given figure, $\angle SPR = \angle QRP$ and $\angle RSP = \angle PQR$. Show that $PQ = SR$.

Marks (4)

Q 17 In triangle ABC, $AB = AC$ and $AD \perp BC$. Prove that $\angle B = \angle C$.

Marks (4)

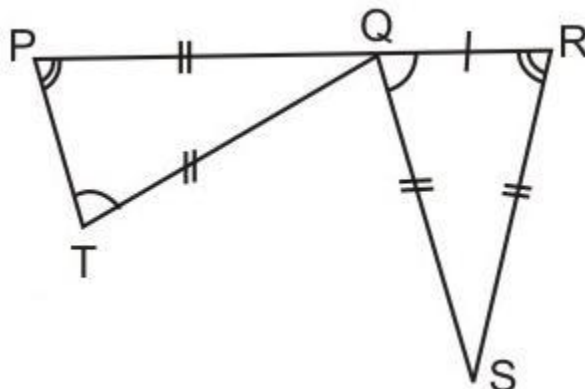
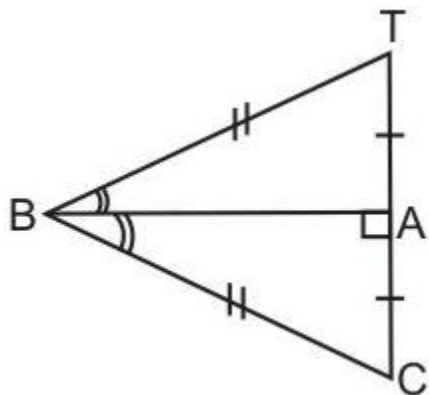
Q 18 ABCD is a quadrilateral, diagonal AC bisects $\angle A$ and $AB = AD$, prove that $DC = BC$.

Marks (4)

Q 19 Figures are given , complete the following:

(i) $\triangle BCA \cong ?$

(ii) $\triangle QRS \cong ?$



Marks (5)

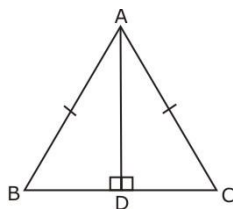
Q 20 ABC is an isosceles triangle with $AB = AC$ and AD is one of its altitudes.

(i) State the three pairs of equal parts in $\triangle ADB$ and $\triangle ADC$.

(ii) Is $\triangle ADB \cong \triangle ADC$? Why or why not?

(iii) Is $\angle B = \angle C$? Why or why not?

(iv) Is $BD = CD$? Why or why not?



Marks (5)

Most Important Questions

Q 1 Fill in the blanks:

- 1) Two line segments are congruent if they have the same
- 2) Two circles are congruent if they have the same.....
- 3) Two squares are congruent if they have equal
- 4) Two angles are congruent if they have the same

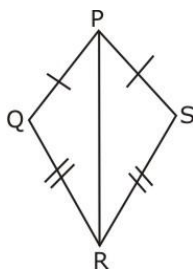
Q 2 Give any three real life examples of congruent shapes.

Q 3 If triangle ABC is congruent to triangle FED under the correspondence of $\triangle ABC \cong \triangle FED$, write all the corresponding congruent parts of the triangles.

Q 4 If $\triangle ABC \cong \triangle FED$, write the parts of $\triangle FED$ that correspond to

- a) $\angle B$ b) BC c) $\angle C$ d) AC

Q 5 In the given figure, it is given that $PQ = PS$ and $QR = SR$

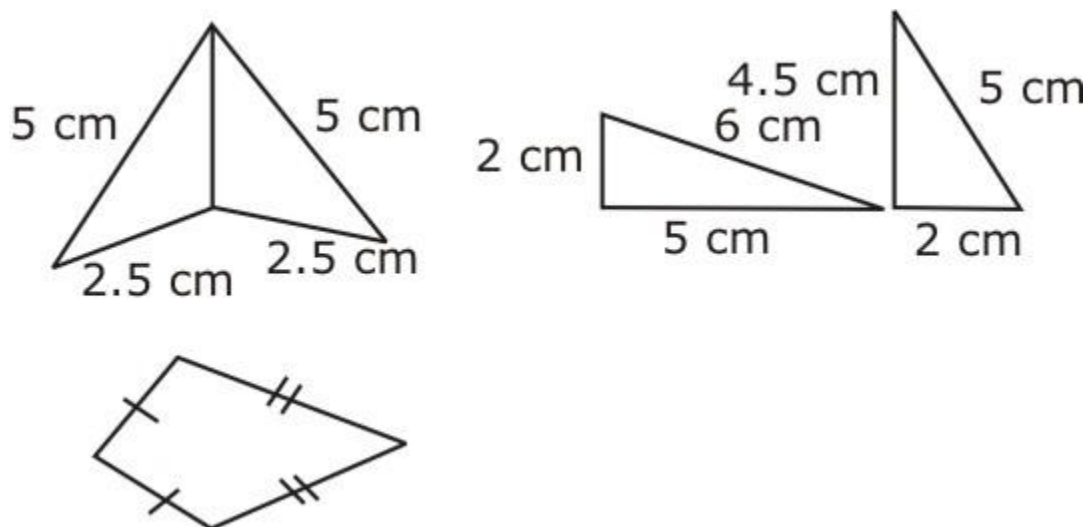


(i) State the three pairs of equal parts in $\triangle PQR$ and $\triangle PSR$.

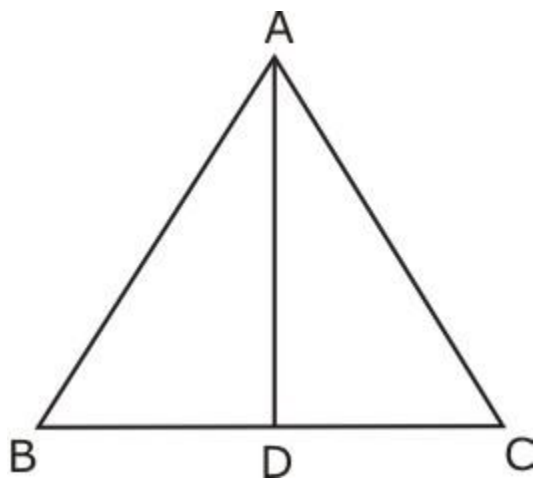
(ii) Is $\triangle PQR \cong \triangle PSR$? Why or why not?

(iii) Does PR bisect angle P and angle R?

Q 6 In the given figures identify the triangles that are congruent.



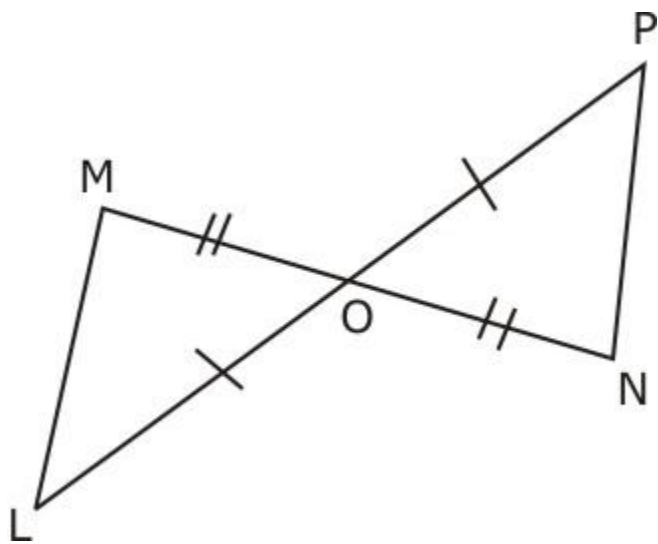
Q 7 In the given figure $AB = AC$ and D is the mid-point of BC .



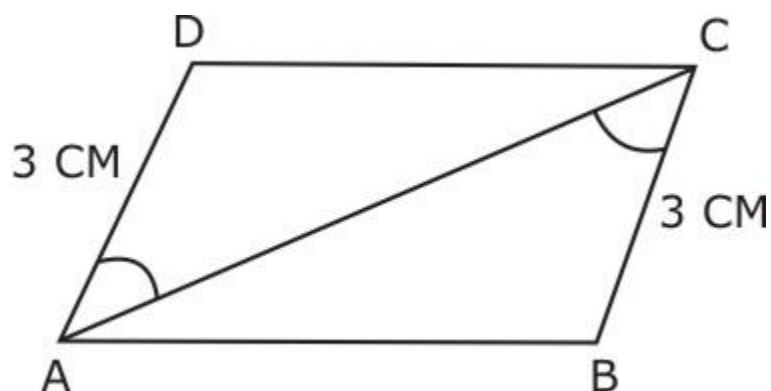
- (i) State the three pair of equal parts in $\triangle ADB$ and $\triangle ADC$
- (ii) Is $\triangle ADB \cong \triangle ADC$? Give reasons.
- (iii) Is $\angle B = \angle C$? Why?

Q 8 In triangle PQR what will be the included angle between the sides PQ and QR.

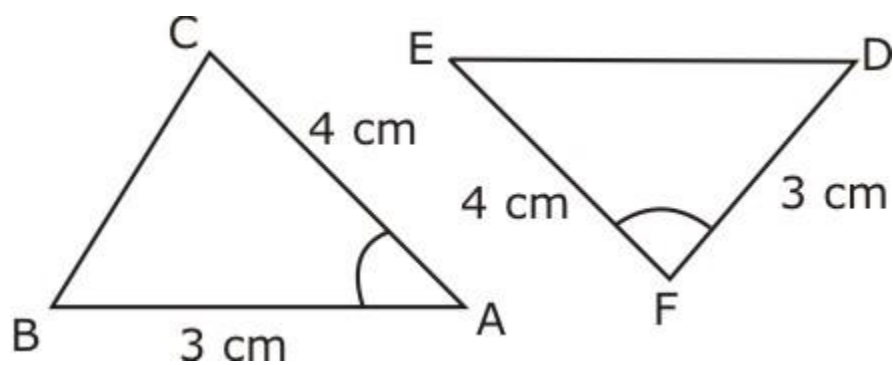
Q 9 In the given figure identify the triangles that are congruent, by which property? Can we conclude that $ML \parallel NP$?

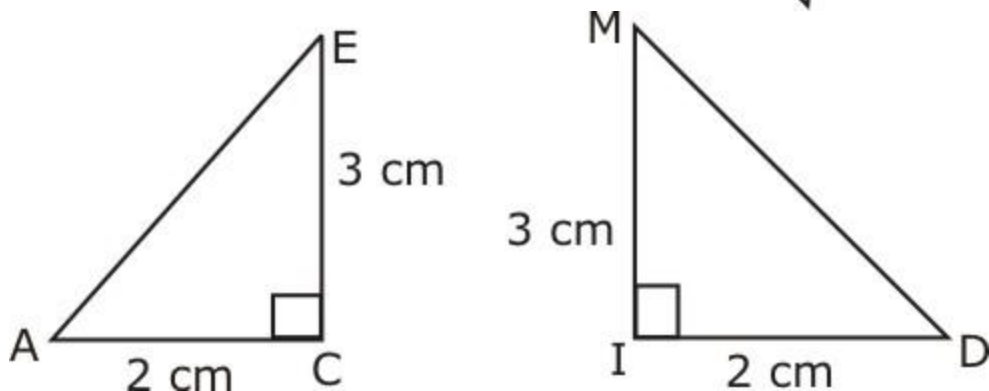
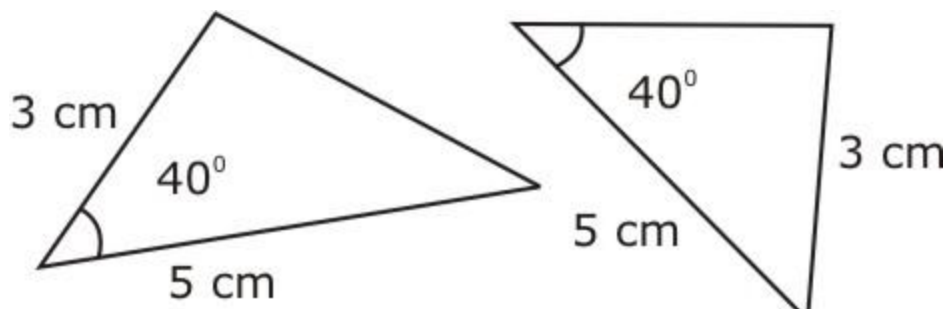


Q 10 In the given figure prove that ABCD is a parallelogram.



Q 11 From the following, identify the congruent figures.



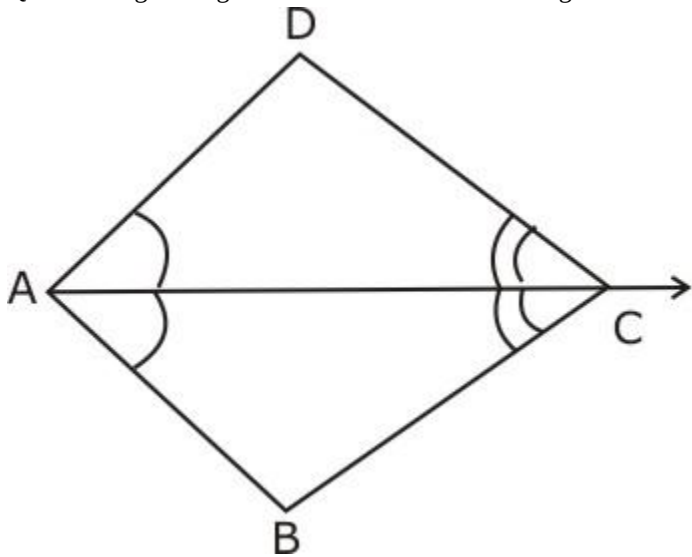


Q 12 In RHS congruence Rule: What does RHS stand for?

Q 13 Show that $\triangle ART \cong \triangle PEN$ By ASA congruence rule and it is given that $AT = PN$, what other two congruence condition do you need?

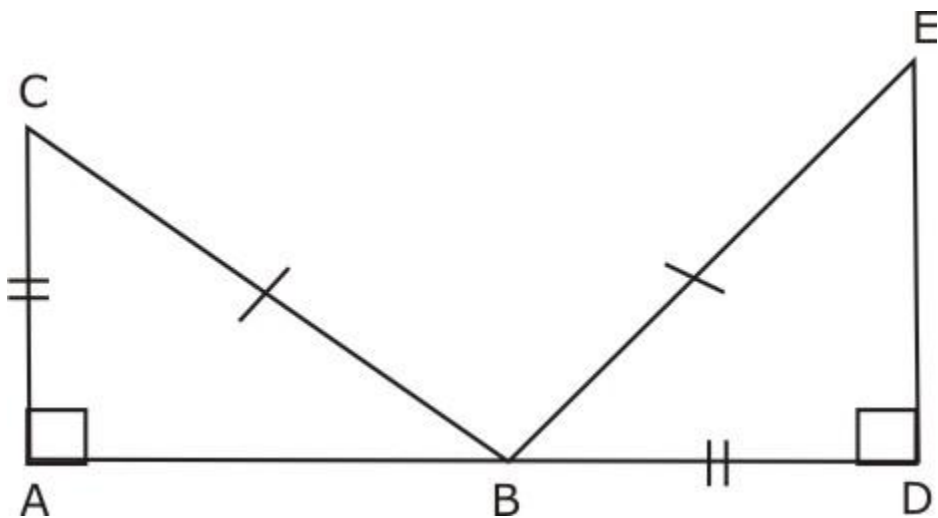
Q 14 If all the angles of one triangle are respectively equal to all the angles of the other triangle then are the two triangles congruent?

Q 15 In the given figure establish the criteria of congruence between the two triangles

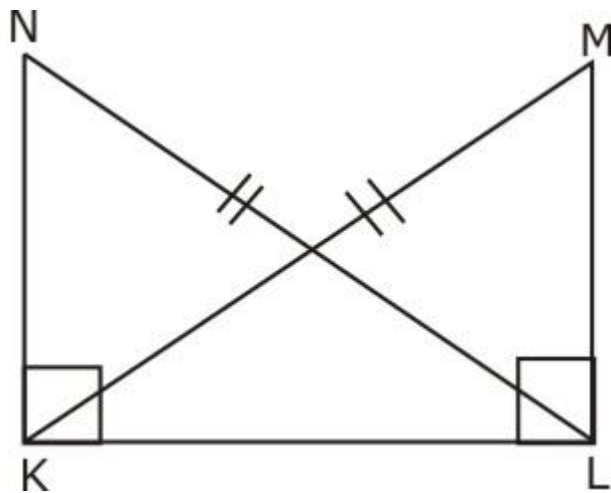
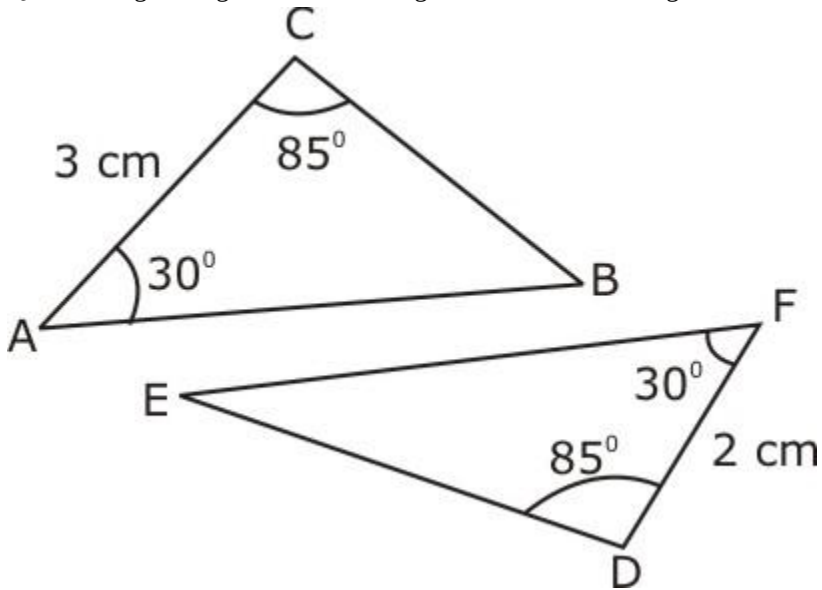


- State the three equal parts of congruence
- Is $AD = AB$? Why?

Q 16 In the given figure are the two triangles congruent? Name the congruent parts that are equal.

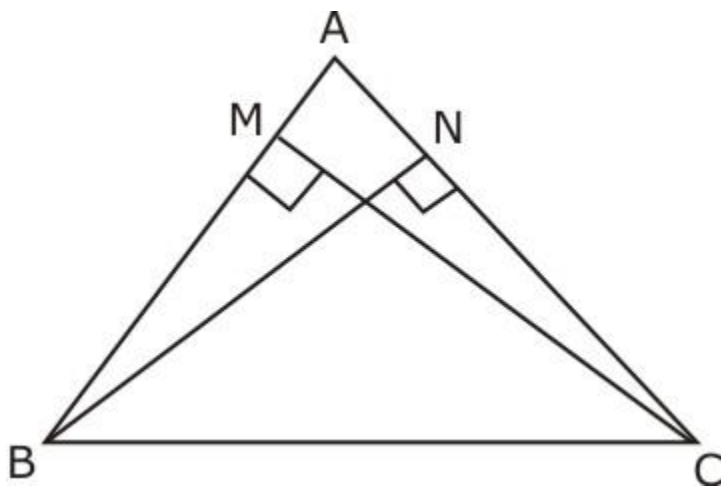


Q 17 In the given figures, are the triangles ABC and DEF congruent ?

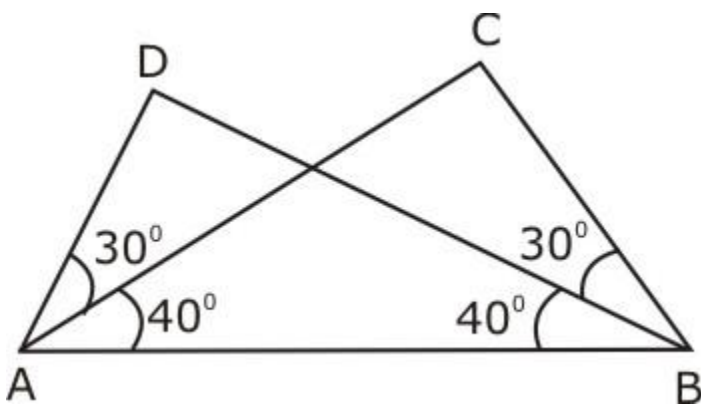


Q 18 In the given figures, are the triangles congruent?

Q 19 In the given triangle, $AB = AC$, CM and BN are the altitudes of the triangle; prove that the altitudes of the triangle are equal?



Q 20 In the given figure, prove that the triangles are congruent.



Q 21 Given below are measurements of some parts of two triangles. Examine whether the two triangles are congruent or not, by ASA congruence rule. In case of congruence, write it in symbolic form.

(i) In $\triangle DEF$, $\angle D = 60^\circ$, $\angle F = 80^\circ$, $DF = 5$ cm

In $\triangle PQR$, $\angle Q = 60^\circ$, $\angle R = 80^\circ$, $QR = 5$ cm

(ii) In $\triangle DEF$, $\angle E = 80^\circ$, $\angle F = 30^\circ$, $EF = 5$ cm

In $\triangle PQR$, $\angle P = 80^\circ$, $PQ = 5$ cm, $\angle Q = 30^\circ$

8. Comparing Quantities

Q 1 The cost of one packet of balls having 20 balls is Rs. 100, what will be the cost of such 24 balls.

Mark (1)

Q 2 A basket is full of fruits mangoes, oranges and apples. If 60% are mangoes, 10% are oranges than what is the percentage of apples.

Mark (1)

Q 3 In a village, 30% people are women, 40% are men rest are Children what is the percentage of children in the village.

Mark (1)

Q 4 Total numbers of beads in a bag are 20, if red beads are 8 and blue beads are 12, find out the percentage of each colour of beads.

Marks (2)

Q 5 Fill in the blanks :

i $\frac{1}{3}$ = ----%

ii $\frac{1}{6}$ = ----%

Marks (2)

Q 6 Find the ratio of

i. 1m to 1 km

ii. 1 week of Feb. to Feb. month of a non leap year..

Marks (2)

Q 7 Convert the following into fractions and decimals.

i) $24\frac{1}{2}$ %

ii) 39.2%

Marks (2)

Q 8 Calculate the following:

i) 12% of 1200

ii) 30% of 300

Marks (2)

Q 9 Find out the numbers if

i. 10% of number is 600

ii. 12% of number is 1080.

Marks (2)

Q 10 The loss in a company has decreased from 20 lacs to 5 lacs in one year. Find the loss decrease percentage.

Marks (3)

Q 11 A man buys 3 oranges for Rs. 4 and sells 4 oranges for Rs. 6. Find his Gain or loss per cent.

Marks (3)

Q 12 Out of 30 students in a hostel, 8 are going to market, 20 are going to watch T.V, rest of the students are studying. Convert all of them into percentages.

Marks (3)

Q 13 A person divides his income in three equal parts if he gives 2 parts to Ram and 1 part to Shyam. What percentage of money he gives to Ram and Shyam separately.

Marks (3)

Q 14 A shopkeeper sells an article of ₹400, while he purchases it for ₹402. Find out loss per cent of shopkeeper.

Marks (3)

Q 15 Angles of a quadrilateral are in ratio 2 : 3 : 3 : 4, find out all the angles of quadrilateral.

Marks (4)

Q 16 If Rs 250 is to be divided amongst Ravi, Raju and Roy such that Ravi gets two parts, Raju three parts and Roy five parts. How much money will each get? What will it be in percentage?

Marks (4)

Q 17 If Rs 1250 is to be divided amongst Raj, Pallavi and Ronit such that Raj gets two parts, Pallavi three parts and Ronit five parts. How much money will each get? What will it be in percentage?

Marks (4)

Q 18 Find the simple interest on Rs. 1200 from Jan 1, 2006 to March 14, 2006 at 6% per annum.

Marks (5)

Q 19 A man purchases two machines at Rs. 1200 each. On one he gain 20% and on the other he loses 20%. How much does he gain or lose in whole transaction.

Marks (5)

Most Important Questions

Q 1 Ratio is a means of comparing quantities of similar kinds . (T/F)

Q 2 Is $2:4 = 1:2$?

Q 3 Define Unitary Method.

Q 4 Find the ratio of Rs 500 to 50,000 paise.

Q 5 Are the two ratios equal?

$\frac{2}{5}$ and $\frac{3}{8}$

Q 6 The weight of one iron ball is 16 kg. Find the weight of 8 such iron balls.

Q 7 The cost of 9 bowls is Rs 72. Find the cost of 6 such bowls.

Q 8 Find the ratio of 40 days to 40 hrs.

Q 9 The population of Rajasthan is 570 lakh and population of U.P is 1,560 lakh in the same area. Find the ratio of their population.

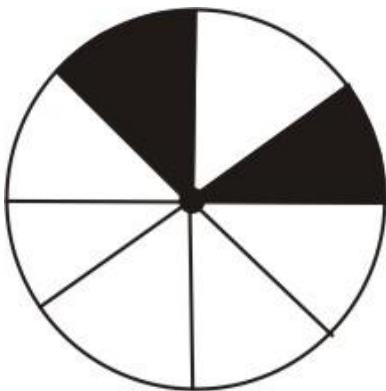
Q 10 Neelu got 320/400 in her report card. Hari scored 280/400 in his report card. Who scored more percentage of marks?

Q 11 Write $\frac{3}{4}$ in the form of percentage.

Q 12 Out of 80 students in a class 30 are girls. Find the percentage of girls in class.

Q 13 There are 25 radios. 16 of them are damaged. Find the percentage of damaged radios.

Q 14 What percentage of the figure is shaded?



Q 15 Find 2% of 1hr in minutes :

Q 16 Find the whole quantity if 5% of it is 600:

Q 17 Convert 45% into fraction

Q 18 What percent of the total distance of 100km is 22km?

Q 19 Convert 33% into decimals

Q 20 Convert 540/400 into decimals

Q 21 $35\% + \underline{\quad}\% = 100\%$

Q 22 In a survey of 40 students, 25% of students liked to play football. What is the number of students who liked to play football?

Q 23 Convert 0.45 into percentage:

Q 24 In a village, 30% people are women, 40% are men rest are Children what is the % of children in the village.

Q 25 0.6 % expressed as fraction is

Q 26 Find the ratio of

i. 1m to 1 Km.

ii. 1 week of Feb. to Feb. month in 2007.

Q 27 The cost of one packet of balls having 20 balls is Rs. 100, what will be the cost of such 24 balls.

Q 28 Total numbers of beads in a bag are 20, if red beads are 8 and blue beads are 12, find out the percentage of each colour of beads.

Q 29 Convert into percentage.

i $\frac{1}{3} = \text{---}\%$ iii $\frac{1}{6} = \text{---}\%$

Q 30 Out of 30 students in a hostel, 8 are going to market, 20 are watching T.V, rest of the students are studying convert all of them into percentage.

Q 31 Convert the following into fraction and Decimal

i. $24\frac{1}{2}\%$

ii. 39.2%

Q 32 A basket is full of fruits mangoes, oranges and apples if 60% are mangoes, 10% are oranges than what is the percentage of apples.

Q 33 Calculate the following

i 12% of 120

ii 30% of 300

Q 34 Find out the numbers if

i. 10% of the number is 600

ii. 12% of number is 1080

Q 35 A team won 6 matches out of total that they played. If their win percentage is 60 percent, what is the total number of matches they played? How many did they lose? What is their loss %?

Q 36
$$\text{Profit}\% = \frac{\text{Profit}}{\text{C.P}} \times 100\%$$

Q 37
$$\text{Loss}\% = \frac{\text{Loss}}{\text{C.P}} \times 100\%$$

Q 38 Convert into percentage: - 3 : 4

Q 39 If C.P = Rs x and S.P = Rs y. Find Profit%.

Q 40 If C.P = Rs X and loss% = A% Find Loss.

Q 41 A shirt with marked price Rs 1000 was sold to a customer for Rs 900. Find the % of decrease.

Q 42 The number of illiterate persons in a country decreased from 150 lakhs to 100 lakhs in 10 yrs. What is the decrease percentage?

Q 43 The cost of a flower vase is Rs 120. If the shopkeeper sells it at a loss of 10%, find the Selling price

Q 44 S.P of a toy is Rs 540. If the profit made by the shopkeeper is 20%, find the C.P of the toy.

- Q 45 One person divides his income in two parts if he gives 2 Parts to Ram and 1 part to shayam, what percentage of Money he gives to Ram and Shayam separately.
- Q 46 Angles of a quadrilateral are in ratio 2:3:3:4, find out all the angles of quadrilateral.
- Q 47 The loss in a company is decreasing from 20 lakhs to 5 lakhs, in one year; find out decreasing of loss percentage.
- Q 48 A shopkeeper is selling an article of Rs.400, while he purchases it for Rs. 402 find out loss percent of shopkeeper.
- Q 49 A man buys oranges at 3 for Rs. 4 and sells 4 for Rs. 6, find his Gain or lose percent.
- Q 50 A man sold two machines at Rs. 1200 each. On one he gain 20% and on the other he loses 20%. How much does he gain or lose in whole transaction.
- Q 51 The Difference between the principal and amount is said to be the _____ .
- Q 52 What is the formula to calculate Simple interest for T years?
- Q 53 Find the simple interest that Ram has to pay if he borrows Rs 500 for a period of 5 yrs at the rate of 5% p.a.
- Q 54 The sum of the Simple interest and the principal gives the _____ .
- Q 55 What is the formula to calculate Simple interest for 1 year?
- Q 56 Find the Simple interest of Rs 8500 for 2 years at 8% p.a.
- Q 57 Find the amount to be paid at the end of 3 yrs if the principal amount is Rs 1,200 at 10% p.a.
- Q 58 Find the amount to be paid at the end of an year if the principal amount is Rs 200 at 2% p.a
- Q 59 Find the simple interest on Rs. 1200 from Jan 1 2006 to March 14 2006 at 6% per annum.
- Q 60 What is the sum borrowed if the interest is Rs 45 at the rate of 9% p.a for 1 year?
- Q 61 What rate gives Rs 280 as interest on a sum of Rs 56,000 in 2 years?

9. Rational Numbers

Q 1 Rewrite $\frac{-44}{72}$ in the simplest form.

Mark (1)

Q 2 Write the following rational numbers in ascending order:

$$\frac{-3}{7}, \frac{-3}{2}, \frac{-3}{4}$$

Mark (1)

Q 3 Find out two rational numbers between $-\frac{3}{4}$ and 0.

Mark (1)

Q 4 Find the reciprocal of $\frac{-1}{3} \times \frac{-15}{6}$.

Mark (1)

Q 5

Subtract $\frac{-1}{2}$ from $\frac{4}{5}$.

Marks (2)

Q 6 Arrange the following in ascending order:

$$\frac{-3}{4}, \frac{7}{-9} \text{ and } \frac{11}{-13}$$

Marks (2)

Q 7 Give four rational numbers equivalent to $\frac{-2}{7}$.

Marks (2)

Q 8 Do $\frac{4}{-9}$ and $\frac{-16}{36}$ represent the same rational numbers?

Marks (2)

Q 9 Represent the following rational numbers on number line.

$$\frac{-6}{2} \quad \frac{-5}{2} \quad \frac{-4}{2} \quad \frac{-3}{2} \quad \frac{-2}{2} \quad \frac{-1}{2} \quad 0 \quad \frac{1}{2} \quad \frac{2}{2} \quad \frac{3}{2} \quad \frac{4}{2} \quad \frac{5}{2} \quad \frac{6}{2}$$

Marks (2)

Q 10 Find out six rational numbers between $\frac{-5}{3}$ and $\frac{2}{3}$.

Marks (2)

Q 11 Find the sum of $13\frac{3}{4} + (-11\frac{1}{2})$.

Marks (2)

Q 12 Write down the additive inverse of following rational numbers:
 $\frac{3}{7}$ and $-\frac{4}{9}$

Marks (2)

Q 13 Sum of two rational numbers is -8 , one number is $\frac{3}{4}$, find other.

Marks (2)

Q 14 Product of two rational numbers is $\frac{-8}{9}$, one is $\frac{-10}{3}$, find other.

Marks (2)

Q 15 List four rational numbers between -2 and -1 .

Marks (3)

Q 16 Fill in the blanks with the correct symbol out of $>$, $<$ and $=$.

(i) $\frac{-1}{3} \dots\dots \frac{-1}{4}$

(ii) $0 \dots\dots \frac{-7}{6}$

(iii) $\frac{5}{-11} \dots\dots \frac{-5}{11}$

Marks (3)

Q 17 Given $a = \frac{3}{5}$ and $b = \frac{-2}{5}$ prove that $a + b = b + a$.

Marks (3)

Q 18 Show that the values of $\frac{8}{15} - \frac{7}{10}$ and $\frac{7}{10} - \frac{8}{15}$ are different? State the property which is not satisfied?

Marks (3)

Q 19 If $25\frac{1}{2}$ m rope is cut into 12 equal pieces what will be the length of each piece?

Marks (3)

Q 20 Write three more numbers in the following pattern:
 $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$,...

Marks (3)

Q 21 Simplify $\frac{13}{4} + \frac{-12}{5} + \frac{-3}{4} + \frac{2}{3} + \frac{-3}{5} + \frac{4}{3}$.

Marks (3)

Q 22 Simplify $\left[\frac{2}{3} \times \frac{-5}{4} \right] + \left[\frac{-10}{3} \times \frac{5}{2} \right] - \left[\frac{-16}{3} \times \frac{-55}{32} \right]$.

Marks (3)

Q 23 Simplify $\frac{10}{13} \times \frac{26}{15} + \frac{13}{25} \times \frac{10}{13}$ by using distributive law of multiplication over addition.

Marks (3)

Q 24 From his home, Rahul walks $\frac{6}{7}$ km towards school and then returns $\frac{5}{6}$ km on the same way towards his home to reach a landmark. Where will he be now from his home?

Marks (4)

Q 25 Mayank reads $\frac{1}{3}$ of a storybook on the first day and $\frac{1}{4}$ of the book on the second day. What part of the story book is yet to be read by Mayank?

Marks (4)

Q 26 Seema spends $\frac{3}{4}$ of her pocket money. She spends $\frac{1}{2}$ of it on a book, $\frac{1}{6}$ on a movie and the remaining amount on a dress. What part of her pocket money did she spend on the dress?

Marks (4)

Q 27 If 35 shirts of equal size can be stitched from $49\frac{1}{2}$ metres of cloth, what is the length of the cloth required for each shirt? Find the length of cloth required for 4 shirts of equal size.

Marks (4)

Q 28 Romila, Pooja and Swati went out for dinner in a hotel. Romila paid $\frac{1}{3}$ of the bill, Pooja paid $\frac{1}{5}$ of the bill. Swati paid the remaining part of the bill. What part of the bill was paid by Swati?

Marks (4)

Most Important Questions

Q 1 A rational number is defined as

Q 2 a) Write the rational number as integer : $\frac{9}{1}$

b) Write the integer as rational number : (-8)

Q 3 Which of the rational number is positive ?

$(\frac{3}{7})$, $(-\frac{2}{3})$, $9(-15)$, $(-\frac{4}{13})$

Q 4 Fill in the box in $(\frac{5}{3}) = (\dots/18)$

Q 5 Numerator of $5\frac{3}{4}$ is

Q 6 Write the rational number whose numerator is $4 \times (-7)$ and denominator is $(3 - 7) \times (15 - 11)$.

Q 7 Reduce $(-63)/99$ to the standard form :

Q 8 Write the rational number whose denominator is the smallest 2 digit number and the numerator is the greatest 3 digit number.

Q 9 Express $(-3)/5$ as a rational number with denominator 15.

Q 10 Find x such that $(-3)/7$ and $x/(-21)$ are equivalent rational numbers.

Q 11 Write $\frac{-2}{3}$, $\frac{5}{4}$, $\frac{-3}{7}$ in the ascending order.

Find the value of y and z :

Q 12 $\frac{27}{y} = \frac{9}{-5} = \frac{-45}{z}$

Q 13 Find out two rational numbers between $(-3)/4$ and 0.

Q 14 List five rational numbers between -2 and -1.

Q 15 Do $4/(-9)$ and $(-16)/36$ represent the same rational numbers ?

Identify the smallest rational number :

Q 16 $\frac{-9}{12}$, $\frac{8}{-9}$, $\frac{2}{3}$, $\frac{5}{-6}$

Identify the greatest rational number :

Q 17 $\frac{450}{-7}, \frac{-3}{21}, \frac{5}{7}, \frac{29}{14}$

Q 18 The product of a rational number with its reciprocal is always

Q 19 Find the product of $\frac{-3}{5} \times \frac{35}{7} \times \frac{-1}{6}$.

Q 20 $\frac{3}{14} \div \left(\frac{-9}{56}\right) = ?$

Q 21 The length and the breadth of a rectangle are $\frac{5}{4}$ m and $\frac{7}{3}$ m respectively . The perimeter of the rectangle is

Q 22 $\frac{3}{13} \div \frac{-4}{65}$

Q 23 $\frac{7}{5} + \dots\dots\dots = \frac{7}{3}$

Q 24 $\frac{-6}{13} - \left(\frac{-7}{15}\right) = ?$

Q 25 Write down the additive inverse of following rational numbers

$\frac{3}{7}, -5\frac{1}{2}, 6.2, \frac{-5}{-6}, \frac{12}{-17}$

Q 26 Find the sum of $13\frac{3}{4} + \left(-11\frac{1}{2}\right)$.

Q 27 Subtract $\frac{-1}{2}$ from $\frac{4}{5}$.

Q 28 Sum of two rational numbers is -8, one of them is $\frac{3}{4}$, find the other number.

10. Practical Geometry

Q 1 State true or false: The total measure of all the three angles of a triangle is 360° .

Mark (1)

Q 2 Fill in the blank:

If a $\triangle ABC$ exactly coincides with $\triangle PQR$ then triangles are_____.

Mark (1)

Q 3 If we have $PQ = 5$ cm, $\angle PQR = 115^\circ$ and $\angle QRP = 30^\circ$, can we construct a $\triangle PQR$ with these measurements?

Mark (1)

Q 4 If $AB = QP$, $AC = QR$, $BC = PR$, then $\triangle ABC \cong \triangle QPR$, state the congruence criterion involved here.

Mark (1)

Q 5 We have $PQ = 4$ cm, $PR = 3$ cm and $QR = 8$ cm. Can a triangle with these measurements be possible ? Give reason also.

Mark (1)

Q 6 In a triangle ABC if $AB = 3$ cm , $AC = 5$ cm and $\angle B = 30^\circ$. Can we draw this triangle uniquely ?

Mark (1)

Q 7 If $AB = QP$, $AC = QR$, $BC = PR$, then $\triangle ABC \cong \triangle QPR$, state the congruence criterion involved here.

Mark (1)

Q 8 State true or false: In $\triangle ABC$, the side included between $\angle B$ and $\angle C$ is AB .

Mark (1)

Q 9 In $\triangle ABC$, $BC = CA$. Which of its two angles are equal ?

Mark (1)

Q 10 In triangle DEF $\angle E = \angle F$. Which of its two sides are equal ?

Mark (1)

Q 11 Construct a $\triangle ABC$, in which $\angle B = 70^\circ$, $AB = 4.8$ cm and $BC = 5.2$ cm.

Marks (2)

Q 12 Draw a triangle LMN , in which $MN = 6$ cm, $ML = 4.5$ cm and angle $M = 30^\circ$.

Marks (2)

Q 13 Construct $\triangle XYZ$ in which $XY = 4.5$ cm, $YZ = 5$ cm and $ZX = 6$ cm. Marks (3)

Q 14 Construct $\triangle LMN$, right-angled at M, given that $LN = 5$ cm and $MN = 3$ cm.

Marks (3)

Q 15 Construct a right triangle PQR in which $\angle Q = 90^\circ$, $PR = 6$ cm and $QR = 4$ cm.

Marks (3)

Q 16 In $\triangle PQR$, $QP = QR$. If $\angle P = 36^\circ$, what is the measure of $\angle Q$?

Marks (3)

Q 17 Draw a line, say AB, take a point C outside it. Through C, draw a line parallel to AB using ruler and compasses only.

Marks (3)

Q 18 Construct $\triangle ABC$ in which $AB = 6$ cm, $BC = 3.5$ cm and $CA = 5$ cm.

Marks (3)

Q 19 Draw a line, say AB, take a point C outside it. Through C, draw a line parallel to AB using a ruler and compass only.

Marks (4)

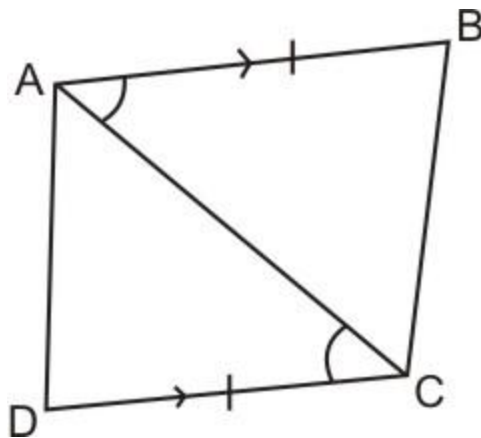
Q 20 Let l be a line and P be a point not on l . Through P, draw a line m parallel to l . Now, join P to any point Q on l . Choose any other point R on m . Through R, draw a line parallel to PQ. Let this meet l at S. What shape do the two sets of parallel lines enclose?

Marks (4)

Q 21 A ladder 17 m long when set against the wall of a house just reaches a window at a height of 15 m from the ground. How far is the lower end of the ladder from the base of the wall?

Marks (5)

Q 22 In Fig. $AB \parallel DC$ and $AB = DC$.



(i) Is $\angle BAC = \angle DCA$? Why?

(ii) Show $\triangle ABC \cong \triangle CDA$ by SAS congruence condition.

Marks (5)

Q 1 Construct a $\triangle ABC$, in which $\angle B = 70^\circ$, $AB = 4.8\text{cm}$ and $BC = 5.2\text{ cm}$.

Q 2 Construct a right angle triangle PQR in which $\angle Q = 90^\circ$, $PR = 6\text{cm}$ and $QR = 4\text{cm}$.

Q 3 In a triangle PQR, if $\angle P = 90^\circ$ and $\angle Q = \angle R$, find the angles of the triangle .

Q 4 If all the three angles of a triangle are of the same measure, find the measure of each of the angles.

Q 5 Construct a triangle ABC such that $AB = 5\text{cm}$, $BC = 4.6\text{cm}$ and $AC = 4.3\text{cm}$.

Q 6 Construct a triangle ABC such that $CB = 6.5\text{cm}$, $CA = 4.2\text{cm}$ and $BA = 5.1\text{cm}$.

Q 7 Construct an isosceles triangle ABC such that $AB = AC = 5\text{cm}$ and $\angle A = 60^\circ$.

Q 8 Construct an isosceles triangle ABC such that $AC = CB$, $AB = 6\text{cm}$ and base angle $= 45^\circ$.

Q 9 Construct an isosceles triangle PQR where the non-equal side $PQ = 4.2\text{ cm}$ and base angles are 30° each .

Q 10 Construct a right angled triangle ABC where $AB = 4.5\text{ cm}$, $AC = 5.8\text{ cm}$ and angle $A = 90^\circ$.

Q 11 Construct an isosceles triangle ABC such that $AB = BC = 4\text{ cm}$ angle $BAC = 60^\circ$.

11. Perimeter and Area

Q 1 State true or false : All triangles equal in area are congruent.

Mark (1)

Q 2 Find the area of the square of side 200 m in hectare.

Mark (1)

Q 3 State true or false : The distance around a circular region is known as area of that circle.

Mark (1)

Q 4 Convert 50 cm^2 in mm^2 .

Mark (1)

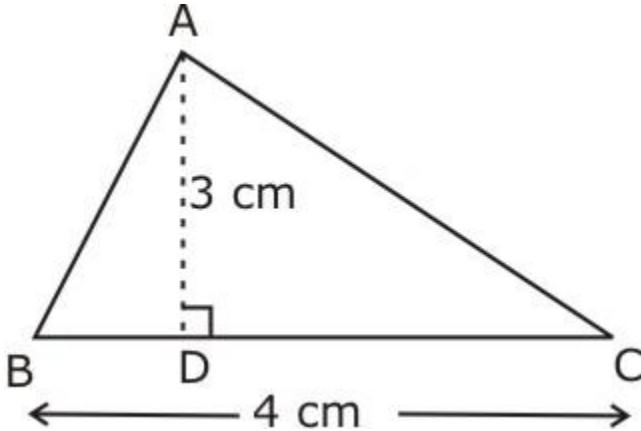
Q 5 Write the formula to find area of circle.

Mark (1)

Q 6 How many times a wheel of radius 14 cm must rotate to go 352 cm?

Marks (2)

Q 7 Find the area of following triangle:



Marks (2)

Q 8 A door frame of dimensions $4 \text{ m} \times 5 \text{ m}$ is fixed on the wall of dimension $11 \text{ m} \times 11 \text{ m}$. Find the total labour charges for painting the wall if the labour charges for painting 1 m^2 of the wall is Rs 2.50.

Marks (2)

Q 9 What is the circumference of a circle of diameter 10cm ? (Take $\pi = 3.14$)

Marks (2)

Q 10 Find the area of a circle of radius 15cm.

(use $\pi = 3.14$)

Marks (2)

Q 11 Find the breadth of a rectangular plot of land, if its area is 440 m^2 and the length is 22 m. Also find its perimeter.

Marks (2)

Q 12 A rectangular garden is 65cm long and 50cm wide. Two cross paths each 2m wide are to be constructed parallel to the sides. If these paths pass through the centre of the garden, find the cost of constructing the paths at the rate Rs. 69 per m^2 .

Marks (3)

Q 13 A rectangular garden is 90 m long and 75 m broad. A path 5 m wide is to be built out around it. Find the area of the path.

Marks (3)

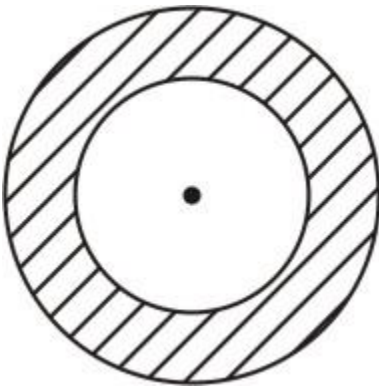
Q 14 The figure given below, shows two circles with the same centre. The radius of the larger circle is 10 cm and the radius of the smaller circle is 4 cm.

Find:

(a) the area of the larger circle,

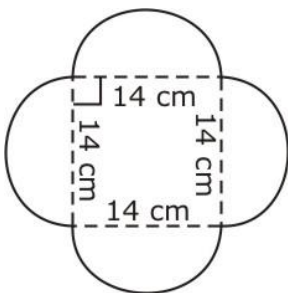
(b) the area of the smaller circle,

(c) the shaded area between the two circles. (Take $\pi = 3.14$)



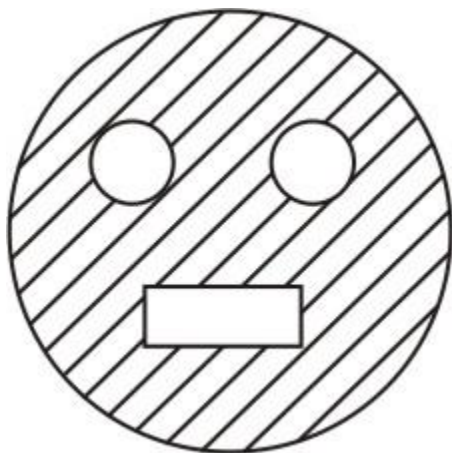
Marks (3)

Q 15 Find the perimeter of the given shape. (Take $\pi = \frac{22}{7}$)



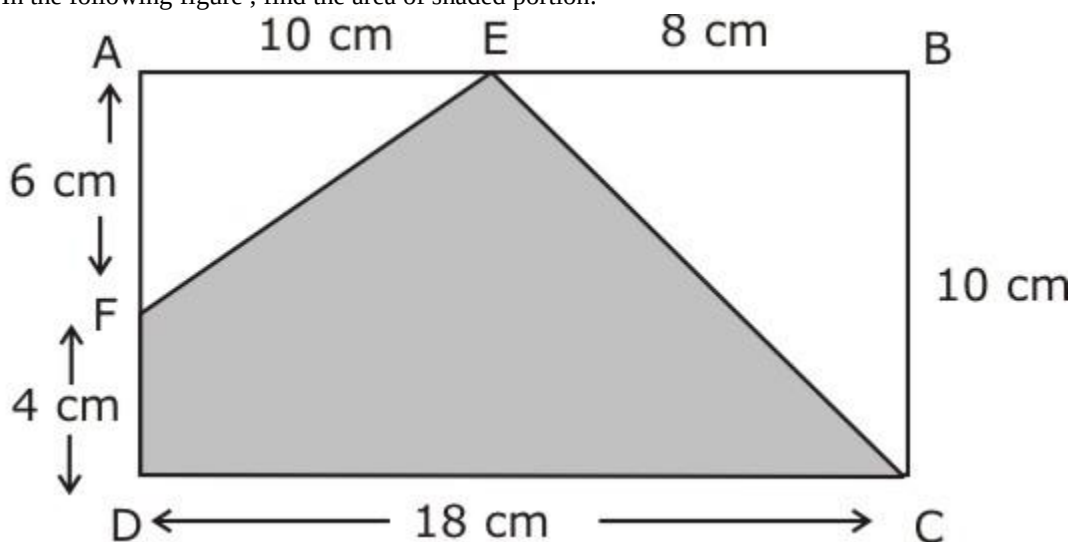
Marks (3)

Q 16 From a circular card sheet of radius 14 cm, two circles of radius 3.5cm and a rectangle of length 3cm and breadth 1 cm are removed (as shown in the figure). Find the area of the remaining sheet. (Take $\pi = 22/7$)



Marks (4)

Q 17 In the following figure, find the area of shaded portion:



Marks (4)

Q 18 A wire is in the shape of a square of side 10 cm. If the wire is rebent into a rectangle of length 12 cm, find its breadth. Which encloses more area – the square or the rectangle?

Marks (4)

Q 19 The area of a square and a rectangle are equal. If the side of the square is 40 cm and the breadth of the rectangle is 25 cm, find the length of the rectangle. Also, find the perimeter of the rectangle.

Marks (4)

Q 20 Anand took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also, find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area – the circle or the square?

$$\left(\text{Take } \pi = \frac{22}{7} \right)$$

Marks (4)

Q 21 A wire is in the shape of a square of side 10 cm. If the wire is rebent into a rectangle of length 12 cm, find its breadth. Which encloses more area – the square or the rectangle?

Marks (4)

Q 22 The area of a square and a rectangle are equal. If the side of the square is 40 cm and the breadth of the rectangle is 25 cm, find the length of the rectangle. Also, find the perimeter of the rectangle.

Marks (4)

Q 23 Anand took a wire of length 44 cm and bent it into the shape of a circle. Find the radius of that circle. Also, find its area. If the same wire is bent into the shape of a square, what will be the length of each of its sides? Which figure encloses more area – the circle

$$\left(\text{Take } \pi = \frac{22}{7} \right)$$

or the square?

Marks (4)

Q 24 A wire is in the shape of a rectangle. Its length is 40 cm and breadth is 22 cm. If the same wire is rebent in the shape of a square, what will be the measure of each side? Also find which shape encloses more area?

Marks (5)

Most Important Questions

Q 1 The _____ is the distance around a given two-dimensional object.

Q 2 _____ is a quantity expressing the two-dimensional size of a defined part of a surface, typically a region bounded by a closed curve.

Q 3 Perimeter of a regular polygon = _____ X Length of each side

$$\text{Length of rectangle} = \frac{\text{?}}{\text{Breadth of rectangle}}$$

Q 4

Q 5 One – fourth of the perimeter of a square gives the _____.

Q 6 A door frame of dimensions 4m X 5m is fixed on the wall of dimension 11m X 11m. Find the total labour charges for painting the wall if the labour charges for painting 1m^2 of the wall is Rs 2.50.

Q 7 Find the breadth of a rectangular plot of land, if its area is 440m^2 and the length is 22m. Also find its perimeter.

Q 8 The length and breadth of a rectangular field is 10 cm and 6 cm respectively. Find the perimeter of the field. What will be its area?

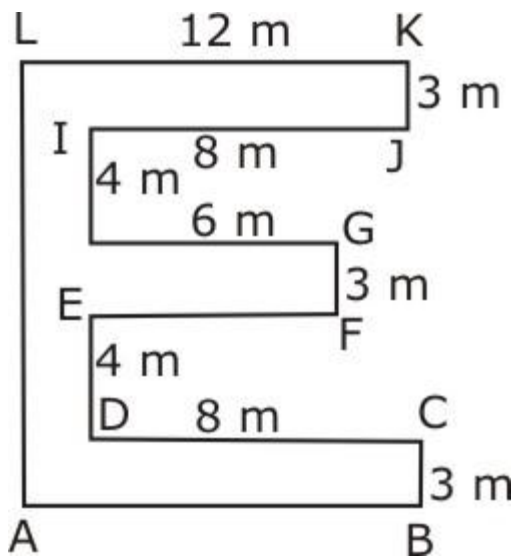
Q 9 A rectangle's length is $(2x + 1)$ cm and its width is $(2x - 1)$ cm. If its area is 15 cm^2 , find the value of x ?

Q 10 A rectangle has a length of 6 cm and diagonal 10 cm, find the width of the rectangle ?

Q 11 A wire is in the shape of a rectangle. Its length is 40cm and breadth is 22cm. If the same wire is rebent in the shape of a square, what will be the measure of each side? Also find which shape encloses more area?

Q 12 If the area of the rectangle is 105 cm^2 . Its length is $(4x - 5)$ cm and breadth is $(2x - 5)$ cm , find the perimeter ?

Q 13 A rectangle has a length that is 2 less than 3 times the width. If the area of the rectangle is 16 cm^2 , find the dimensions.



Q 14 Find the perimeter of the given figure.

Q 15 A rectangular field has dimensions 84 m by 37 m. Find the cost of fencing its boundary at the cost of Rs 2.50/m. What will be the cost of digging the entire field at the cost of Rs 15/m².

Q 16 State true or false:

Any side of the parallelogram can be chosen as base of the parallelogram.

Q 17 State true or false:

If we cut a rectangle along its one diagonal, we get two triangles. If we cut it along both of its diagonals, we get four triangles.

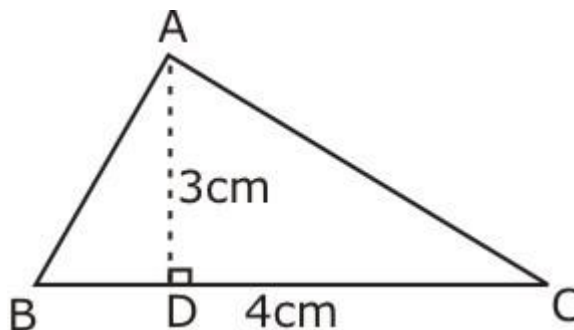
Q 18 If we cut a square along one of its diagonals, two triangles are obtained.

Area of each triangle obtained = ?

$$\text{Height of parallelogram} = \frac{\text{?}}{\text{Base of parallelogram}}$$

Q 19

Q 20 If we cut a parallelogram along one of its diagonals, we obtain two triangles. These triangles are equal in area because _____.



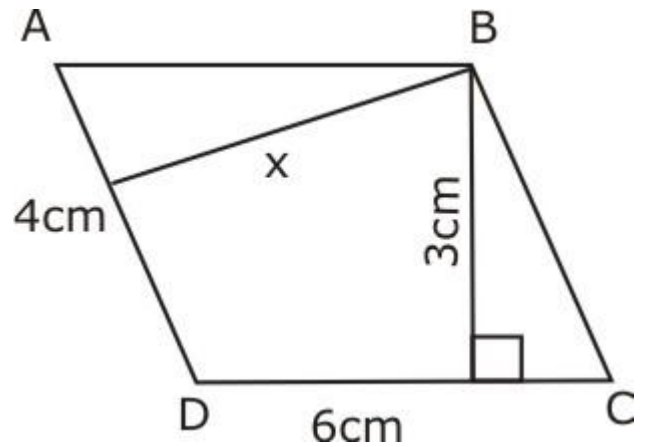
Q 21 Find the area of following triangle:

Q 22 The length & breadth of a rectangle are 23 cm & 11 cm respectively. Find the area of the triangles formed by joining one of its diagonals.

Q 23 The side of a square is 4 cm. Find the area of the triangles formed by joining all of its diagonals.

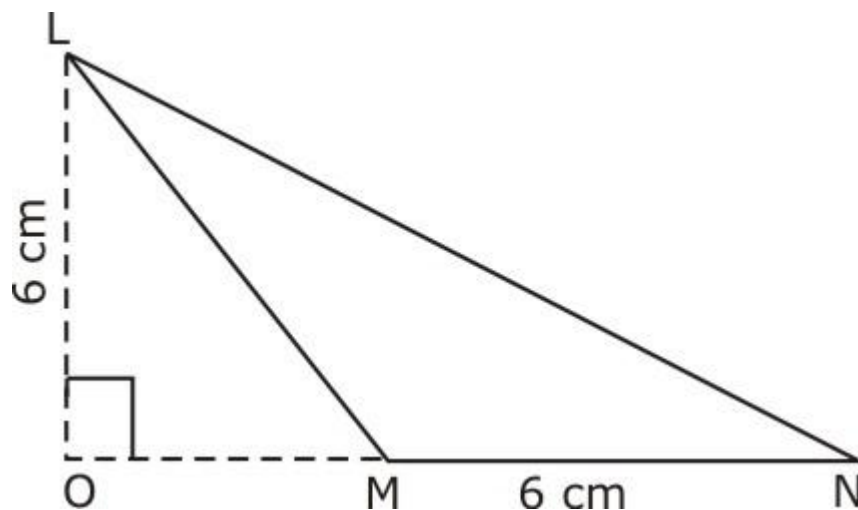
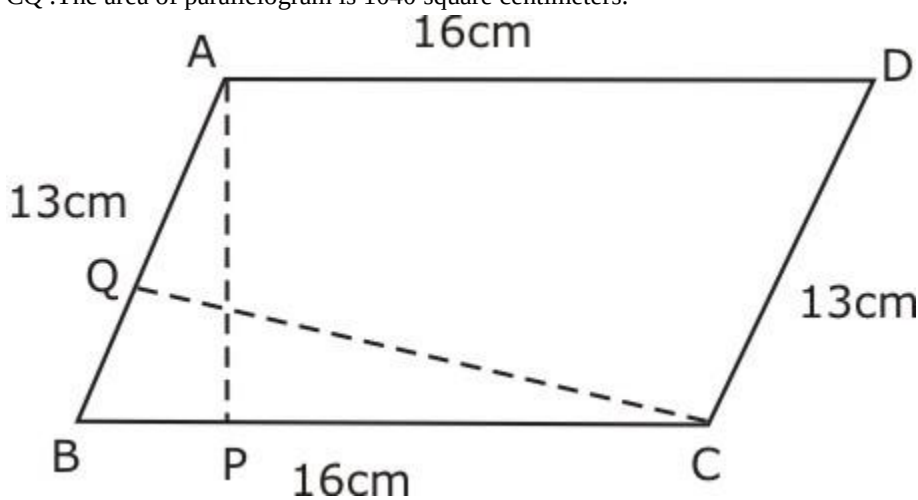
Q 24 Find the area of the rectangle and of its congruent parts shown in the figure:

Q 25 The two sides of the parallelogram ABCD are 6cm and 4cm. The height corresponding to the base CD is 3cm, as shown in fig. Find the



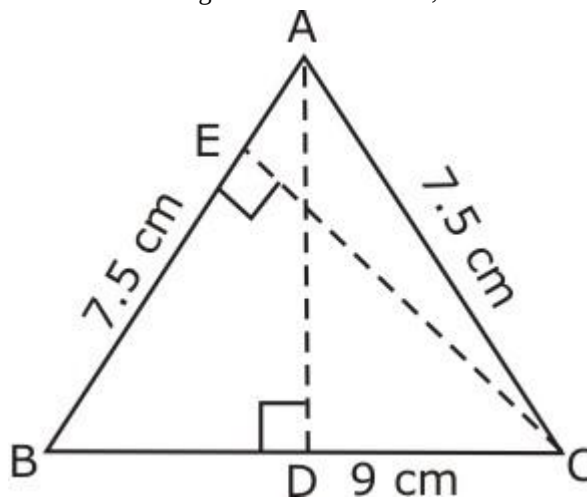
(i) area of the parallelogram (ii) the height corresponding to the base AD.

Q 26 The sides of the parallelogram ABCD are 16cm & 13cm. If AP & CQ are respectively perpendicular to BC & AB; find AP & CQ .The area of parallelogram is 1040 square centimeters.



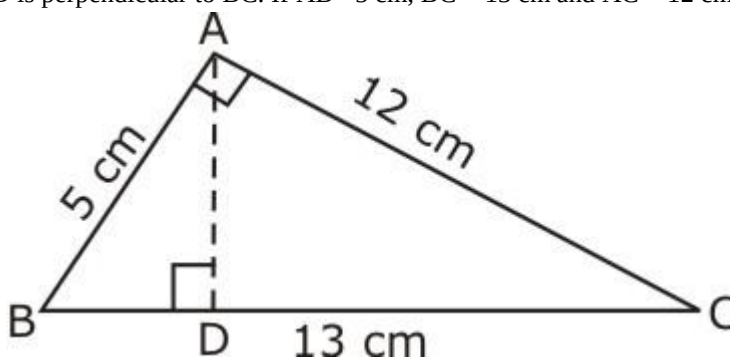
Q 27 Find the area of the triangle :

Q 28 Triangle ABC is isosceles with $AB = AC = 7.5$ cm and $BC = 9$ cm . The height AD from A to BC, is 6 cm. Find the area of



triangle ABC. What will be the height from C to AB i.e., CE?

Q 29 Triangle ABC is right angled at A. AD is perpendicular to BC. If $AB = 5$ cm, $BC = 13$ cm and $AC = 12$ cm, Find the area of



triangle ABC. Also find the length of AD.

Q 30 State true or false:

The distance around a circular region is known as area of that circle.

Q 31 State true or false:

When a path runs along inside a rectangle, the width of the path should be divided from the length and breadth of the outer rectangle.

Q 32 State true or false:

When a path runs outside, twice the width of the path should be added to length and breadth of the inner rectangle.

Q 33 Write the formula to find area of circle.

Q 34 $1 \text{ cm}^2 = \underline{\hspace{1cm}} \text{ m}^2$.

Q 35 What is the circumference of a circle of diameter 10 cm. (Take $\pi = 3.14$)

If $C = 22 \text{ cm}$,

$$\pi = \frac{22}{7},$$

Q 36 $r = ?$

Q 37 Is the ratio of the circumference of a circle to its diameter a constant? If yes, what is it called? What is its value?

Q 38 A garden is 90m long and 75m broad. A path 5m wide is to be built out around it. Find the area of the path.

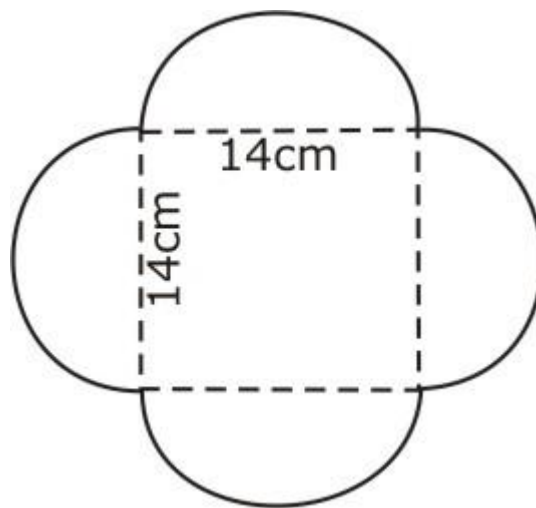
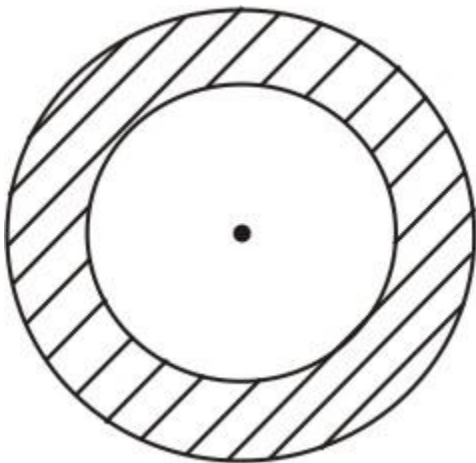
Q 39

The adjoining figure shows two circles with the same centre. The radius of the larger circle is 10 cm and the radius of the smaller circle is 4 cm.

Find:

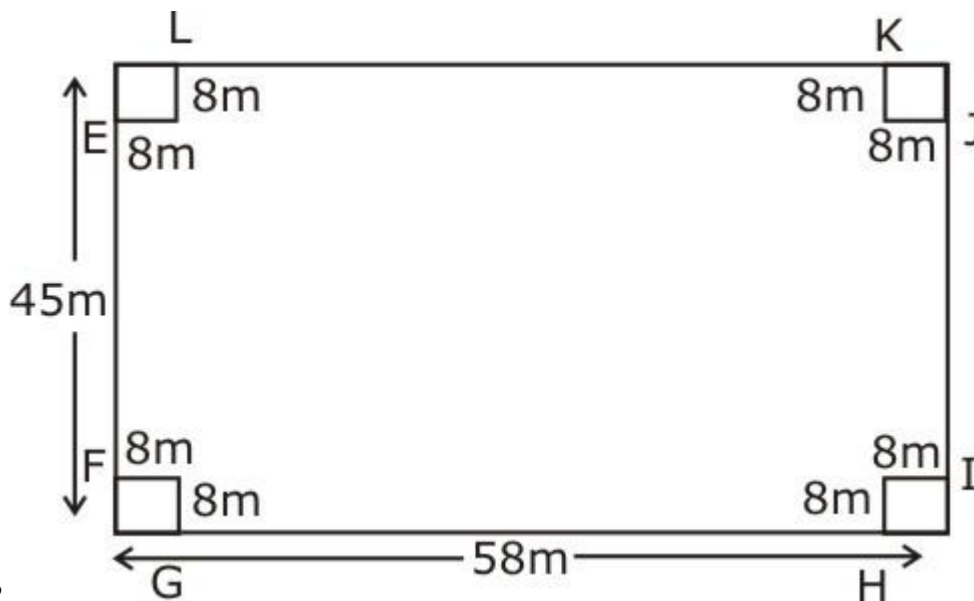
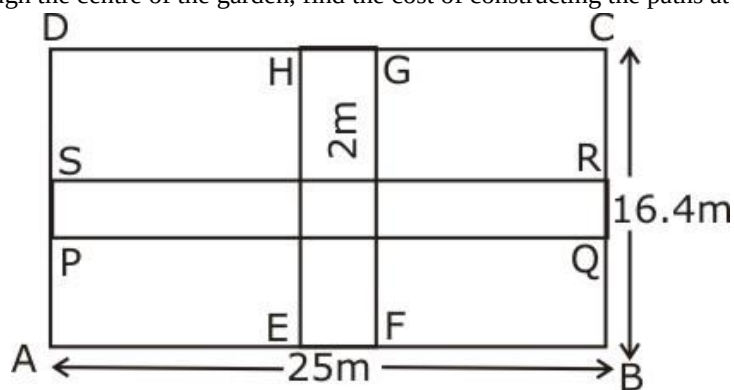
- (a) the area of the larger circle
- (b) the area of the smaller circle
- (c) the shaded area between the two circles.

(Take $\pi = 3.14$)



Q 40 Find the perimeter of the given shape. (Take $\pi = 22/7$)

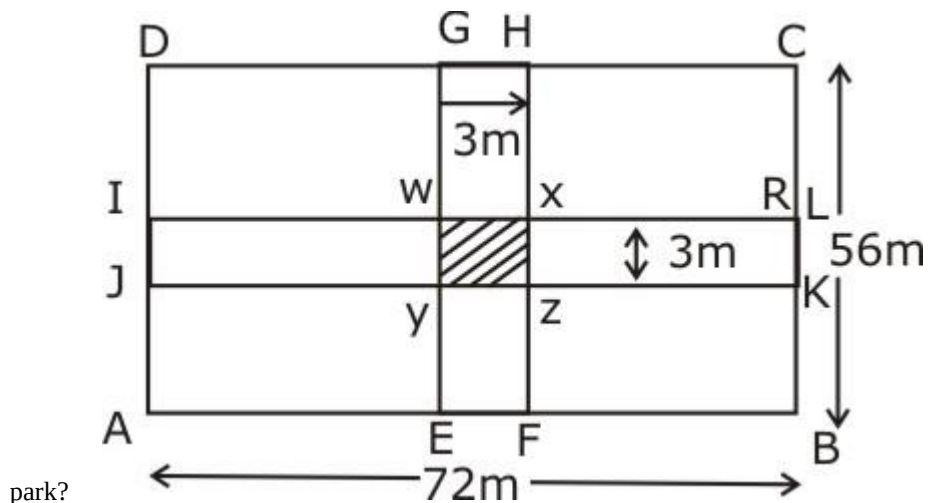
Q 41 A rectangular garden is 65 long and 50 cm wide. Two cross paths each 2m wide are to be constructed parallel to the sides. If these paths pass through the centre of the garden, find the cost of constructing the paths at the rate Rs.69 per m^2 .



Q 42

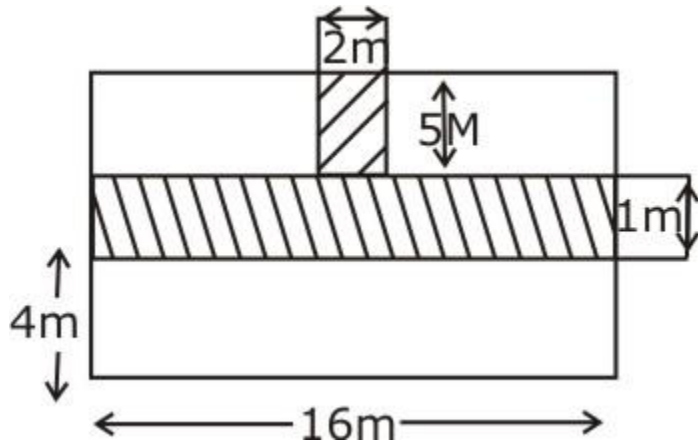
A field has four square corners as shown in the figure. Find the perimeter excluding the square corners.

Q 43 Two cross road each 3m wide, cut at right angles through the centre of a rectangular park 72m by 56 m, such that each is parallel to one of the sides of the rectangle. Find the area of the remaining portion of the park?



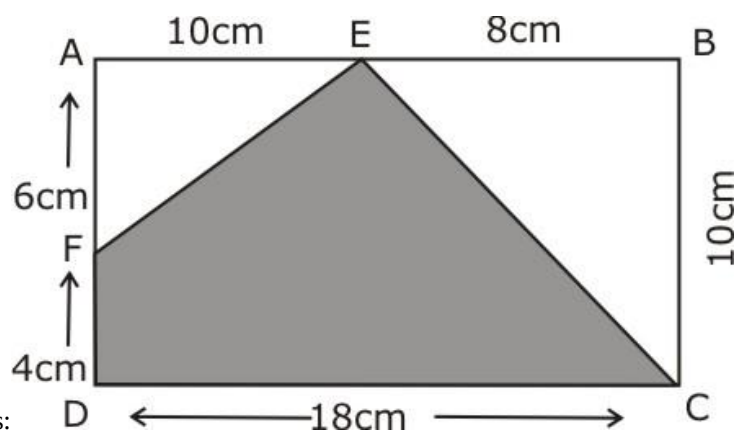
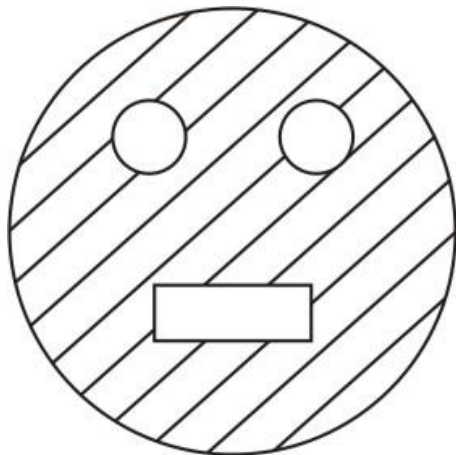
park?

Q 44 Find the area of the shaded portion & the area of the remaining portion.



Q.45

From a circular card sheet of radius 14cm, two circles of radius 3.5cm and a rectangle of length 3cm and breadth 1cm are removed (as shown in the adjoining figure). Find the area of the remaining sheet. (Take $\pi = \frac{22}{7}$)



Q 46 In the following figure , find the area of shaded portions:

12. Algebraic Expressions

Q 1 Multiply $2a$ and $3a$.

Mark (1)

Q 2 What does $3x \times 4x$ represent geometrically?

Mark (1)

Q 3 Fill in the blank : When terms have the same algebraic factor, they are called ...

Mark (1)

Q 4 Get the algebraic expressions for subtraction of z from y .

Mark (1)

Q 5 Find the value of $x + 4$ for $x = 2$.

Mark (1)

Q 6 Fill in the blank : When terms have different algebraic factor, they are called.....

Mark (1)

Q 7 Subtract $-5y^2$ from y^2 .

Mark (1)

Q 8 Find the product of

$$(2x + 3y)(2x + 3y)$$

Marks (2)

Q 9 Find the product of

$$(3x - 5y)(3x - 5y)$$

Marks (2)

Q 10 Find the value of $100 - 10x^3$ for $x = 2$.

Marks (2)

Q 11 Find the value $a^2 + 2ab + b^2$ for $a = 3$, $b = 2$.

Marks (2)

Q 12 What should be added to $x^2 + xy$ to obtain $5x^2 - xy$?

Marks (2)

Q 13 Evaluate 991^2 by using suitable identity.

Marks (2)

Q 14 Simplify $(5x - 2y)(5x + 2y)$.

Marks (2)

Q 15 Fill in the blanks:

- (i) An expression which contains two unlike terms is called
- (ii) An expression which contains one term is called
- (iii) An expression which contains three unlike terms is called.....

Marks (3)

Q 16 Find the value of the following expression for $m = 3$ and $n=1$.

$$(150m + 11n)^2 - (150m - 11n)^2$$

Marks (3)

Q 17 Simplify the expression:

$$12m^2 - 9m + 5m - 4m^2 - 7m + 10$$

Marks (3)

Q 18 Find the product

$$\left(\frac{2}{3}xyz\right)\left(\frac{3}{4}x^2y^2z^2\right)\left(\frac{4}{5}x^3y^3z^3\right)$$

. Marks (3)

Q 19 Multiply the monomials a^3 , $\frac{1}{2}a^2$ and $-100a$. Verify your result for $a = -1$.

Marks (3)

Q 20 Find the product $\left(2x - \frac{1}{2}y\right)\left(\frac{3}{4}x - 10y + 8\right)$.

Marks (4)

Q 21 Identify, in the following expressions, terms which are not constants. Give their numerical coefficients:

$$xy+4, 13-y^2, 13-y+5y^2, 4p^2q-3pq^2+5$$

Marks (4)

Q 22 Simplify these expressions and find their values, if $x = 3$, $a = -1$, $b = -2$.

- (i) $3x - 5a - x^2 + 9b$ (ii) $2b - 8x + 4x^2 + 4a$
- (iii) $3a + 5 - 8x + 1$ (iv) $10x - 3b - 4a - 5b^2$

Marks (4)

Q 23 Find the value of the following expressions for

$$a = 3, b = 2.$$

- (i) $(a + b)^2$ (ii) $13(7a - 4b)$
- (iii) $a^2 + 2ab + b^2$ (iv) $a^3 - b^3$

Marks (4)

- Q 24 (i) From the sum of $13x - 8y + 11$ and $-y - 11$, subtract $3x - 3y - 11$.
(ii) From the sum of $4 + 3x$ and $5 - 4x + 2x^2$, subtract the sum of $3x^2 - 5x$ and $-x^2 + 2x + 5$.

Marks (4)

Q 25 Find the value of the following expressions for

$a = 4$, $b = 3$.

- (i) $(a + b)^2$ (ii) $13(7a - 4b)$
(iii) $a^2 + 2ab + b^2$ (iv) $a^3 - b^3$

Marks (4)

- Q 26 (i) From the sum of $13x - 8y + 11$ and $-y - 11$, subtract $3x - 3y - 11$.
(ii) From the sum of $4 + 3x$ and $5 - 4x + 2x^2$, subtract the sum of $3x^2 - 5x$ and $-x^2 + 2x + 5$.

Marks (4)

Q 27 Simplify these expressions and find their values,

if $x = -3$, $a = -2$, $b = -5$.

- (i) $3x - 5a - x^2 + 9b$
(ii) $2b - 8x + 4x^2 + 4a$
(iii) $3a + 5 - 8x + 1$
(iv) $10x - 3b - 4a - 5b^2$

Marks (4)

- Q 28 From the sum of $2y^2 + 3yz$, $-y^2 - yz - z^2$ and $yz + 2z^2$, subtract the sum of $3y^2 - z^2$ and $-y^2 + yz + z^2$.

Marks (5)

Most Important Questions

Q 1 Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.

- (i) Subtraction of p from q .
(ii) One-fourth of the sum of numbers m and n .
(iii) Product of numbers x and y subtracted from their 10.
(iv) The number x multiplied by itself.

Q 2 Get the algebraic expressions in the following cases using variables, constants and arithmetic operations.

- (i) Numbers p and q both squared and added.
(ii) Sum of numbers a and b added to their product.
(iii) Number 3 subtracted from five times the product of number a and b .
(iv) One-third of the product of number a and b .

Q 3 Identify the terms and their factors in the following expressions.

Show the terms and factors by tree diagrams.

- (a) $m - n$
(b) $1 + a + a^2$.
(c) $x - x^3$.
(d) $3mn^2 + 5m^2n$
(e) $-xy + 2y^2 - 5x^2$.

Q 4 Identify terms and factors in the expressions given below:

- (b) $-2p + 3q$
- (c) $xy + y$
- (d) $mn + 3m^2n^2$
- (e) $-7m + 3n^2$

Q 5 Identify terms and factors in the expressions given below:

- a) $1.2xy - 2.4y + 4.8x$
- b) $(\frac{3}{4})x + (\frac{1}{5})$
- c) $0.2x^2 + 0.3y^2$

Q 6 Identify the numerical coefficients of terms (other than constants) in the following expressions:

- (a) $1 + t + t^2 + t^3$
- (b) $2(a + b)$
- (c) $0.1x + 0.002x^2$
- (d) $3.14r^2$

Q 7 Identify terms which contain m and give the coefficients of m.

- (a) $12 + m + mn$
- (b) $3mn^2 + 20$
- (c) $13m^2 - 7mn$
- (d) $2 + m + mn$

Q 8 Identify terms which contain x^2 and give the coefficients of x^2 .

- (a) $x^2 + y$
- (b) $8 - x^2y$
- (c) $2x^2 + 5y$
- (d) $3x^2y + 13xy^2 + 2y^2$

Q 9 Classify into monomials, binomials and trinomials.

- (a) $1 + a + 3a^2$
- (b) x^2
- (c) $3p^2q - 2pq^2$
- (d) $1 + x + y$

Q 10 State whether a given pair of terms is of like or unlike terms.

- (a) 23, 203
- (b) $12mn, 12m^2n^2$
- (c) $3pr^2, 12pr^2$

Q 11 State whether a given pair of terms is of like or unlike terms.

- (a) $2x, 3y$
- (b) $14ab, 21ab$
- (c) $-3x, x$

Q 12 Add the following expressions:

- (a) $a + 2b, 3a + 4b$
- (b) $4 + x - x^2, 2x^2 - 3x - 1$
- (c) $2x + 9y - 7z, 3y + z - 3x, 2z - 4y - x$
- (d) $p^2 - 2q^2 - 5r^2 + 2pqr, q^2 - 3p^2 + 2r^2 - 5pqr, r^2 - p^2 - 2q^2 + pqr$

Q 13 Simplify combining like terms:

- (a) $m - (m - n) - n - (n - m)$
- (b) $(3q^2 + 5q - 4) - (8q - q^2 - 4)$
- (c) $5x^2y - 5x^2 + 3yx^2 - 3y^2 + x^2 - y^2 + 8xy^2 - 3y^2$
- (d) $3a - 2b - ab - (a - b - ab) + 3ab + b - a$

Q 14 Subtract:

(a) $6mn$ from $-14mn$

(b) $2x^2 - 5x - 3$ from $7 - 2x - 3x^2$

(c) $3p^3 - 5p^2q + 2q^2$ from $q^2 - p^2q - 4p^3$

(d) $2abc - a^2 - b^2$ from $b^2 + a^2 - 2abc$

Q 15 What should be added to $m^2 + n^2 + mn$ to obtain $2m^2 + 3mn$?

Q 16 What should be added to $m^2 + n^2 + mn$ to obtain $2m^2 + 3mn$?

Q 17 What should be added to $7a - 9b + 13c$ to get $9a + b - c$?

Q 18 What should be subtracted from $x + 2y - 3z$ to get $3x - 2y + z$?

Q 19 What should be taken away from $3a^2 - 4b^2 + 5ab + 20$ to obtain $-a^2 - b^2 + 6ab + 20$?

Q 20 Subtract the sum of $a + 2b - 3c$ and $2c - 3b - 4a$ from the sum of $5b - 4c + a$ and $2c - 3b - 4a$.

Q 21 From the sum of $4 + 3x$ and $5 - 4x + 2x^2$, subtract $3x^2 - 5x$.

Q 22 ✕ Find the values of the following expressions for $y = 3$.

(a) $y^2 + 2y + 3$

(b) $19 - 5y^3$

(c) $100 - 10y^2$

(d) $2y + 5$

Q 23 Find the values of the following expressions for $n = -2$.

(a) $8n - 3$

(b) $2n^2 + 3n + 5$

(c) $n^3 + 2n^2 + n/2 - 9$

(d) $100 - 10n$

Q 24 If $x = 2$, $y = -2$, find the value of :

(a) $x^3 + y^3$

(b) $2x^2y + 2xy^2 + xy$

(c) $x^2 - y^2$

(d) $5xy/2 - 3$

Q 25 Simplify the expression and find its value when $m = 6$ and $n = 7$.

$$2(m^2 + mn) + 3 - mn$$

13.Exponents and Powers

Q 1 Show that $\left(\frac{9}{13} \times \frac{-11}{17}\right)^{-8} = \left(\frac{13}{9}\right)^8 \times \left(\frac{17}{-11}\right)^8$.

Mark (1)

Q 2 Find the value of $(-9)^3 \times (-4)^2$.

Mark (1)

Q 3 Find the value of $(6^0 - 2^0) \times (6^0 + 2^0)$.

Mark (1)

Q 4 Express $(3^7 \times 3^3) \times 3^3$ as a rational number with negative exponent.

Mark (1)

Q 5 Express $(-4)^{-1} \times \left(\frac{1}{3}\right)^{-1}$ as a rational number.

Mark (1)

Q 6 Simplify $\frac{14^4}{7^4}$

Mark (1)

Q 7 Simplify $(2^7 \times 2^8) \div 2^{12}$

Mark (1)

Q 8 Simplify $2^3 \times 2^2 \times 5^5$ and write the answer in the exponential form.

Mark (1)

Q 9 Find the value of $(4^2)^5$.

Mark (1)

Q 10 Simplify $7^x \times 7^2$ and write the answer in exponential form.

Mark (1)

Q 11 Express 65,950 in the standard forms.

Mark (1)

Q 12 What number should be multiplied by $(-8)^{-1}$ so that the product may be equal to $(10)^{-1}$?

Mark (1)

Q 13 Simplify $\frac{2 \times 3^4 \times 2^5}{9 \times 4^2}$.

Marks (2)

Q 14 Which one is greater 10^2 or 2^{10} ?

Marks (2)

Q 15 Write 104278 in expanded form.

Marks (2)

Q 16 State true or false and justify your answer:

(i) $10 \times 10^{11} = 100^{11}$

(ii) $2^3 \times 3^2 = 6^5$

(iii) $3^0 = (1000)^0$

Marks (3)

Q 17 Express the 16000 as a product of power of prime factors.

Marks (3)

Q 18 Simplify

(i) $\frac{3^2 \times 4^5 \times x^4}{3^4 \times 4^3 \times x^9}$ (ii) $\frac{4^5 \times 9^5 \times x^7}{2^3 \times 3^6 \times x^5}$

Marks (3)

Q 19 Express the following numbers in the standard form.

(i) 5,223,000,000 (ii) 256,000,000

Marks (3)

Q 20 Find the number from each of the following expanded forms.

(i) $3 \times 10^4 + 5 \times 10^3 + 5 \times 10^1 + 2 \times 10^0$

(ii) $8 \times 10^6 + 6 \times 10^4 + 8 \times 10^2 + 3 \times 10^1 + 6 \times 10^0$

Marks (3)

Q 21 Express the following numbers in standard form.

(i) 296,851,358,200

(ii) 25,615,646,430

Marks (3)

Q 22 Simplify and write the answer in exponential form.

(i) $3^7 \div 3^4$ (ii) $5^8 \div 5^4$ (iii) $7^8 \div 7^3$ (iv) $6^8 \div 6^3$

Marks (4)

Q 23 Simplify and write the answer in exponential form.

(i) $(6^5)^3 \div 6^3$ (ii) $(9^{50})^3$ (iii) $(5^{32})^5$ (iv) $(2^{64})^5$

Marks (4)

Q 24 Expand a^3b^2 , a^2b^3 , b^2a^3 , b^3a^2 . Find out like terms.

Marks (5)

Q 25 Simplify $\frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$.

Marks (5)

Q 26 Find m so that $\left(\frac{2}{9}\right)^3 \times \left(\frac{2}{9}\right)^{-6} = \left(\frac{2}{9}\right)^{2m-1}$

Marks (5)

Q 27 $\frac{p}{q} = \left(\frac{3}{2}\right)^{-2} \div \left(\frac{8}{27}\right)^{-1/3}$
 $\left(\frac{p}{q}\right)^{-3}$

If $\frac{p}{q} = \left(\frac{3}{2}\right)^{-2} \div \left(\frac{8}{27}\right)^{-1/3}$, find the value of $\left(\frac{p}{q}\right)^{-3}$.

Marks (5)

Q 1 Very large numbers can be easily understood using exponents. (T/F)

Q 2 Is a^2b^3 same as b^3a^2 ?

Q 3 Is m^2n^3 same as m^3n^2 ?

Q 4 In $(-9)^4$, the base is _____ & the exponent is _____.

Q 5 $(-1)^4$ is equal to ____ & $(-1)^5$ is equal to ____.

Q 6 $678^0 = ?$

Q 7 $a^x \div b^x = ?$

Q 8 Is $a^x \times b^x = (ab)^x$

Q 9 $(a^x)^y = ?$

Q 10 Find the value of $(4^2)^5$.

Q 11 Find the value of $(-9)^3 \times (-4)^2$.

Q 12 Express $(3^7 \times 3^3) \times 3^3$ as a rational number with negative exponent.

Q 13 Which one is greater 10^2 or 2^{10} ?

Q 14 By what number should $(-5)^4$ be divided so that the quotient may be equal to 5^{-2} ?

Q 15 Find the greatest number among 8^2 , 2^8 , 2^3 and 3^2 .

Q 16 Express the 16000 as a product of its prime factors.

Q 17 Say true or false and justify your answer:

(i) $10 \times 10^{11} = 100^{11}$

(ii) $2^3 \times 3^2 = 6^5$

(iii) $3^0 = (1000)^0$

Find the value of :

a) $\left|\frac{5}{7}\right|^3$

b) $\left|-\frac{1}{2}\right|^5$

Q 18

Q 19

Find the value of $(6^0 - 2^0) \times (6^0 + 2^0)$

Q 20 Express 65,950 in the standard form.

Q 21 Write 104278 in expanded form.

Q 22 Simplify $\frac{3 \times 7^2 \times 11^8}{11^3 \times 21}$

Q 23 Standard form of 70,040,000,000 is _____.

Q 24 The standard form of 9641.76 is _____

Q 25 The usual form of 1.001×10^9 is _____.

Q 26 The value of $(-4)^{3 \times 5 - 6 \cdot 9}$ is _____.

Q 27 The value of $2^3 \times a^3 \times 5a^4$ is _____.

Q 28 Fill in the blank : $8^{13} \div 8^{19} = \frac{1}{8^{...}}$

Q 29 Simplify $(2^7 \times 2^8) \div 2^{12}$

Q 30 Simplify $(2^{20} \div 2^{15}) \times 2^3$

Q 31 Simplify $\frac{25 \times 5^2 \times t^8}{10^3 \times t^4}$

Q 32 Simplify $\frac{216 \div 6}{3^2 \times 3^0}$

Q 33 While expressing number in the standard form, we express it as a decimal number between -----& -----, including ----, multiplied by a power of ----.

Q 34 Show that $\left(\frac{9}{13} \times \frac{-11}{17}\right)^{-8} = \left(\frac{13}{9}\right)^8 \times \left(\frac{17}{-11}\right)^8$

Q 35 Simplify $\frac{2 \times 3^4 \times 2^5}{9 \times 4^2}$

Q 36 Simplify $\frac{(4^2)^3 \times 4^0 \times 4^{-1}}{2^8}$

Q 37 Simplify $\frac{12^4 \times 9^3 \times 4}{6^3 \times 8^2 \times 27}$

Q 38 Find m so that $\left(\frac{2}{9}\right)^3 \times \left(\frac{2}{9}\right)^{-6} = \left(\frac{2}{9}\right)^{2m-1}$

Q 39 If $\frac{p}{q} = \left(\frac{3}{2}\right)^{-2} \div \left(\frac{6}{6}\right)^{-6}$, find the value of $\left(\frac{p}{q}\right)^{-3}$.

14.Symmetry

Q 1 Fill in the blank :

The angle by which the object rotates is called the

Mark (1)

Q 2 How many lines of symmetry are there in a circle?

Mark (1)

Q 3 State true or false : A square has a rotational symmetry of order 4.

Mark (1)

Q 4 If a figure has two or more lines of symmetry, should it have rotational symmetry of order more than 1? Give one example.

Mark (1)

Q 5 Define rotational symmetry.

Mark (1)

Q 6 Rotation turns an object about a fixed point. This fixed point is the

Mark (1)

Q 7 In a complete turn (of 360°), the number of times an object looks exactly the same is called

Mark (1)

Q 8 How many lines of symmetry are there in a regular hexagon ?

Mark (1)

Q 9 How many lines of symmetry are there in an equilateral triangle?

Mark (1)

Q 10 How many lines of symmetry are there in a regular pentagon ?

Mark (1)

Q 11 State the number of lines of symmetry in rectangle.

Mark (1)

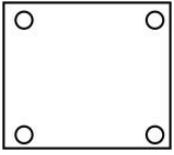
Q 12 Define the line of symmetry.

Mark (1)

Q 13 Name the quadrilaterals which have both line and rotational symmetry of order more than 1.

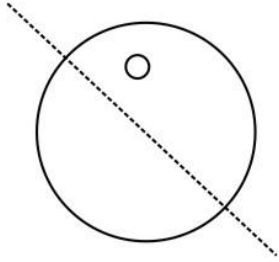
Marks (2)

Q 14 Copy the following figure with punched holes and find the axes of symmetry for the following:



Marks (2)

Q 15 Given the line of symmetry, find the other hole:



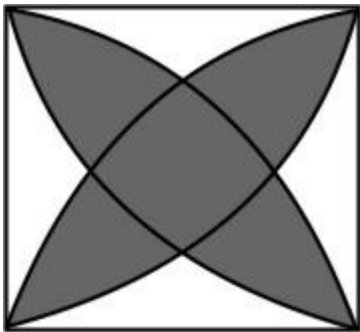
Marks (2)

Q 16 In the following figure, the mirror line (i.e., line of symmetry) is given as a dotted line. Complete each figure performing reflection in the dotted line. Are you able to recall the name of the figure you complete?



Marks (2)

Q 17 For the following figure identify multiple lines of symmetry.



Marks (2)

Q 18 What other name can you give to the line of symmetry of

(a) an isosceles triangle

(b) a circle

Marks (2)

Q 19 Give two examples of shapes with no line of symmetry.

Marks (2)

Q 20 Which letters of the English alphabet have reflectional symmetry about

(a) a vertical mirror

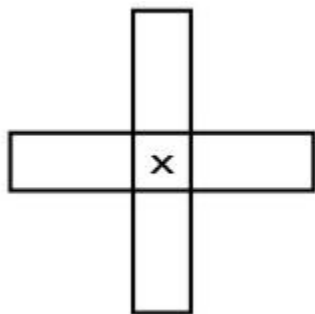
(b) a horizontal mirror

(c) both horizontal and vertical mirrors.

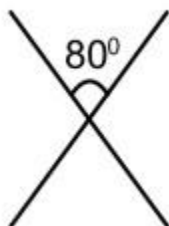
Marks (3)

Q 21 Give the order of rotational symmetry for each figure:

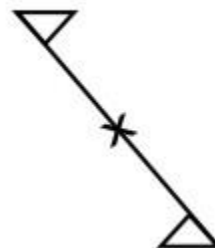
(a)



(b)



(c)



Marks (3)

Q 22 Show the line of symmetry in equilateral triangle, isosceles triangle and scalene triangle.

Marks (4)

Q 23 Find the centre of rotation, order of rotation and angle of rotation of the following shapes.

(i) Square

(ii) Rectangle

(iii) Rhombus

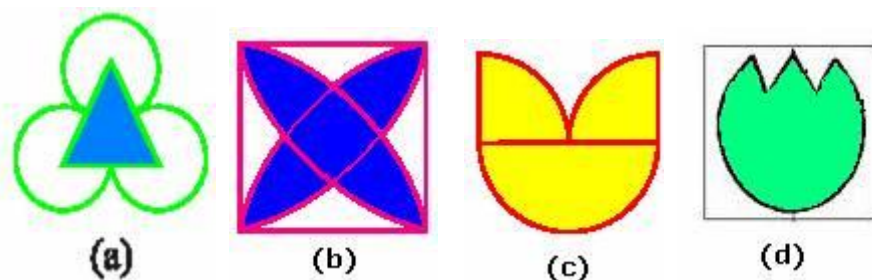
(iv) Circle

Marks (4)

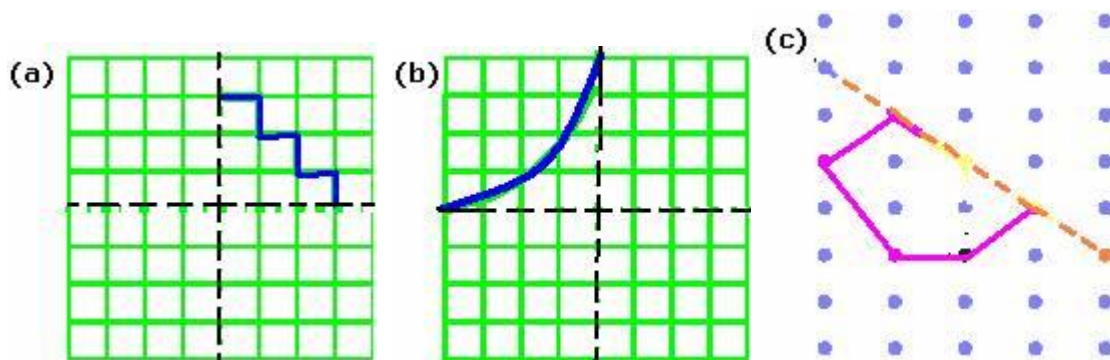
Q 24 Five sticks are arranged in the form of a regular pentagon shape. If we rotate the figure about a fixed point, how many positions are there at which the figure looks exactly the same. Also, find the angle of rotational symmetry.

Marks (4)

Q 1 Identify multiple lines of symmetry (if any) in each of the following figures:



Q 2 Copy the diagram and complete each shape to be symmetric about the mirror line(s):



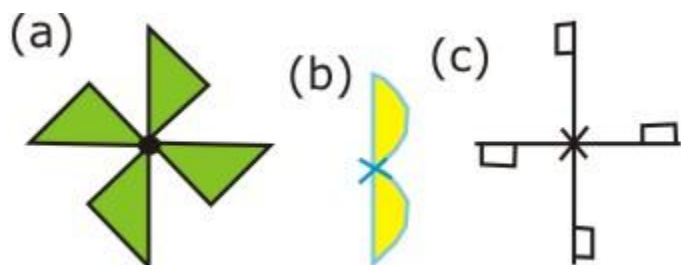
Q 3 State the number of lines of symmetry for the following figures:

- (a) A parallelogram
- (b) A circle
- (c) A regular hexagon
- (d) A rhombus
- (e) A scalene triangle

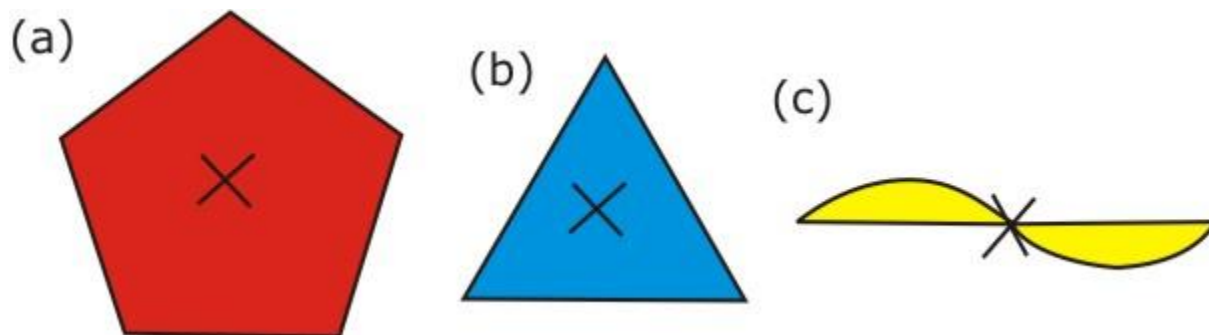
Q 4 What letters of the English alphabet have reflection symmetry about.

- (a) a vertical mirror
- (b) a horizontal mirror
- (c) both horizontal and vertical mirrors

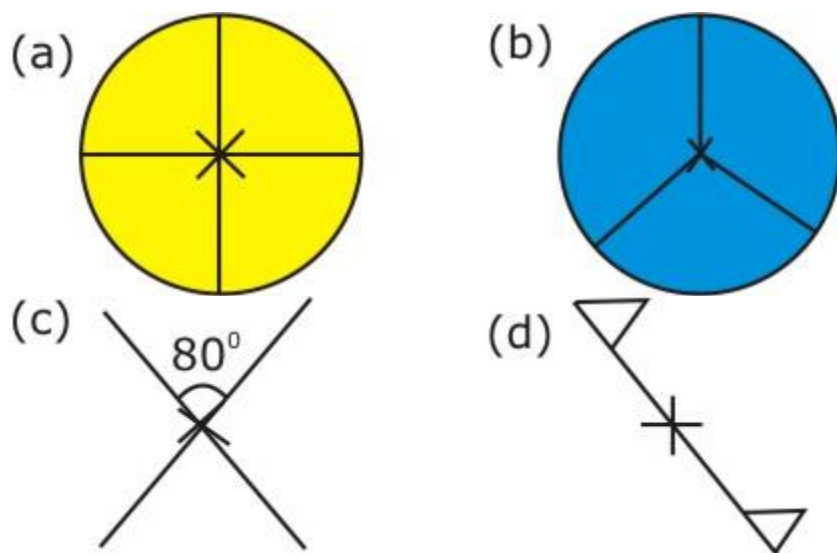
Q 5 Give the order of rotational symmetry for each figure:



Q 6 Give the angle of rotation for each figure:



Q 7 Which of the following figures have rotational symmetry of order more than 1:



Q 8 Name any two figures that have both line symmetry and rotational symmetry.

Q 9 Fill in the blanks:

- (a) A semi-circle has order of rotation
- (b) A regular hexagon has order of rotation.....
- (c) A rectangle has order of rotation.....
- (d) A rhombus has order of rotation.....

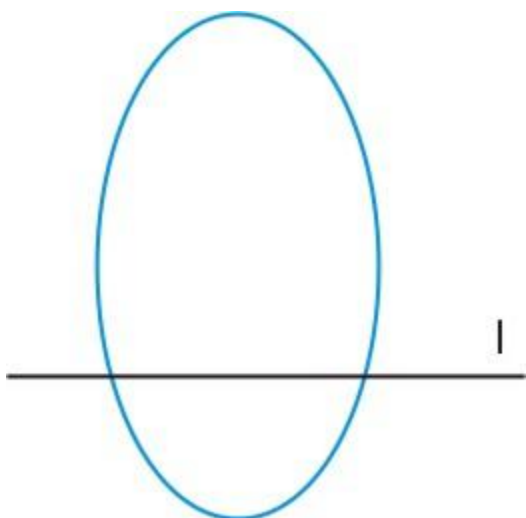
Q 10 Can we have a rotational symmetry of order more than 1 whose angle of rotation is

- (a) 45°
- (b) 60°
- (c) 19°

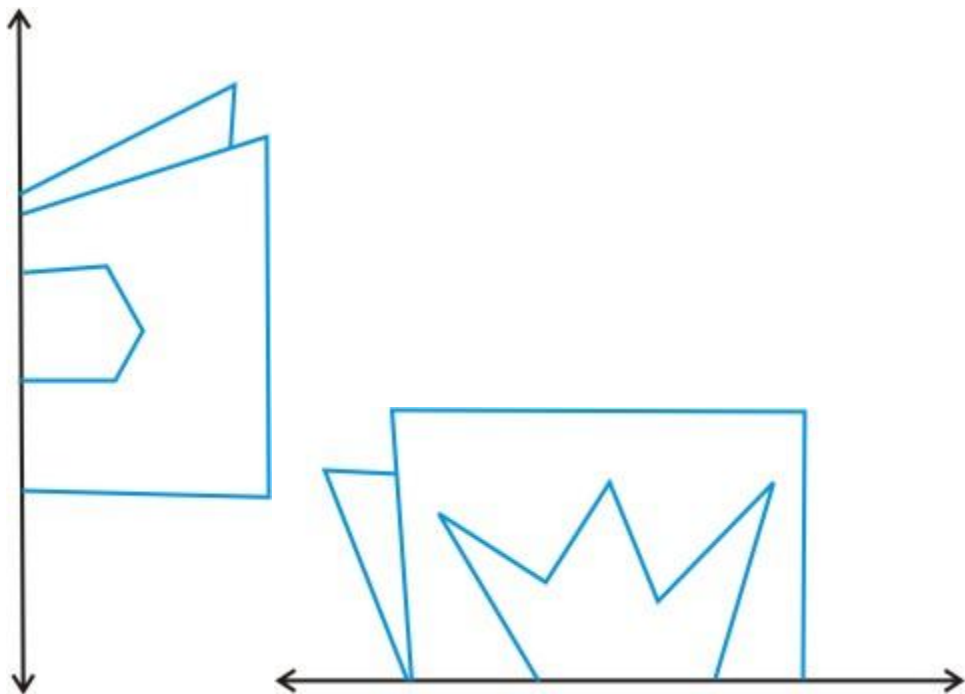
Q 11 Draw, wherever possible, a rough sketch of

- (a) a quadrilateral with line symmetry but not a rotational symmetry of order more than 1.
- (b) a quadrilateral with a rotational symmetry of order more than 1 but not a line symmetry.

Q 12 In the figure, l is the line of symmetry. Draw the image of the triangle and complete the diagram so that it becomes symmetric.

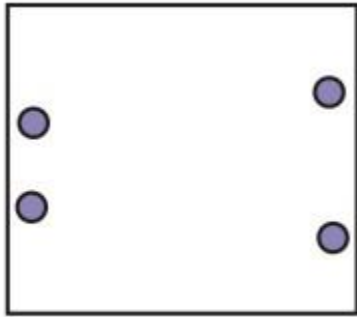


Q 13 Given here are figures of a few folded sheets and designs drawn about the fold. In each case, draw a rough diagram of the complete figure that would be seen when the design is cut off.

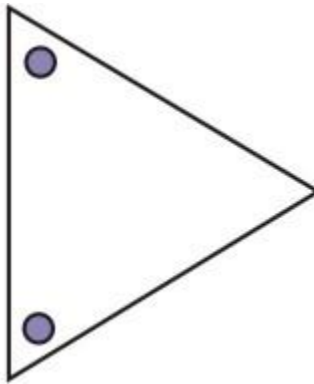


Q 14 Copy the figures with punched holes and find the axes of symmetry for the following:

(a)

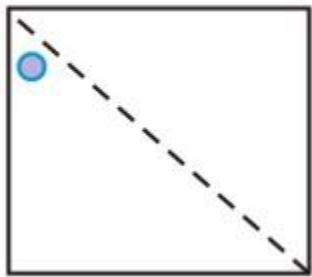


(b)

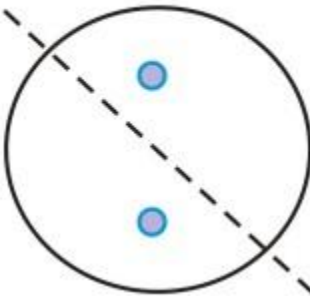


Q 15 Given the line(s) of symmetry, find the other hole(s):

(a)



(b)



Q 16 Give three example of shapes with no line of symmetry.

15. Visualising Solid Shapes

Q 1 Give two examples of plane figures.

Mark (1)

Q 2 Define the net of a solid.

Mark (1)

Q 3 Fill in the blank : The corners of a solid shape are called its

Mark (1)

Q 4 Give two examples of solid shapes.

Mark (1)

Q 5 State true or false: Flat surfaces of solid shape are called its edges.

Mark (1)

Q 6 Fill in the blank : A cube has diagonals.

Mark (1)

Q 7 Fill in the blank : The number of vertices of a cuboid is

Mark (1)

Q 8 Fill in the blank: All the six faces of a..... are congruent and adjacent faces are perpendicular to each other.

Mark (1)

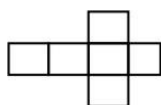
Q 9 Fill in the blank: An sketch does not have proportional lengths.

Mark (1)

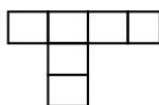
Q 10 Fill in the blank: An sketch is drawn on an isometric dot paper.

Mark (1)

Q 11 Identify the nets which can be used to make cubes.



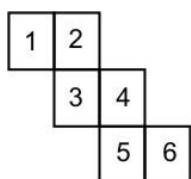
(a)



(b)

Marks (2)

Q 12 Can this be a net for a die? Explain your answer ?



Marks (2)

Q 13 If two cubes of dimensions $2\text{ cm} \times 2\text{ cm} \times 2\text{ cm}$ are placed side by side, what would the dimension of the resulting cuboid be?

Marks (2)

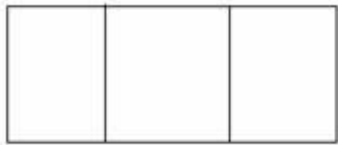
Q 14 Find the surface area of a wooden box whose shape is of a cube of edge 15 cm.

Marks (2)

Q 15 Find the total area of the four walls of a room whose dimensions are 6 m by 4.5 m by 3 m.

Marks (2)

Q 16 Here is an incomplete net for making a cube. Complete it in at least two different ways.



Marks (2)

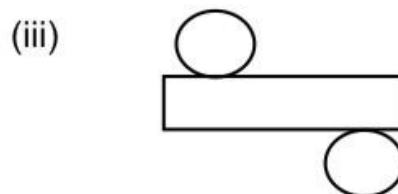
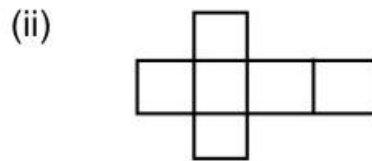
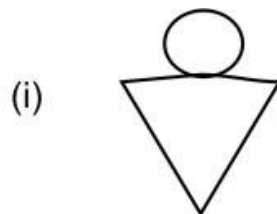
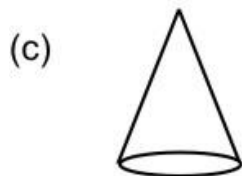
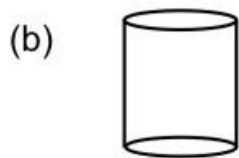
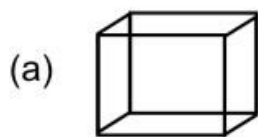
Q 17 A box is in the shape of a cuboid. If its length, breadth and height are 50cm, 20 cm and 15 cm respectively, find its surface area.

Marks (3)

Q 18 How many wooden cubical blocks of edge 12 cm can be cut from another cubical block of wood of edge 3 m and 60 cm?

Marks (3)

Q 19 Match the nets with appropriate solids:



Marks (3)

Q 20 A brick measures 24 cm by 12 cm by 10 cm. How many such bricks are needed to construct a wall of length 5 m, height 2.88 m and thickness 20 cm?

Marks (3)

Q 21 A village, having a population of 4000, requires 150 litres water per head per day. It has a tank measuring 20 m by 15 m by 6 m. For how many days the water of this tank will last?

Marks (3)

Q 22 Write the number of faces, edges and vertices in the solids given below.

- (i) Cube (ii) Pyramid
(iii) Prism (iv) Brick

Marks (4)

Q 23 Draw the figure of cross sections obtained by cutting vertically the following shapes.

- (i) Cylinder (ii) Sphere
(iii) Prism (iv) Cone

Marks (4)

Q 24 Match these two dimensional figures with their names.

(i)



(a)

Triangle

(ii)



(b)

Rectangle

(iii)



(c)

Trapezium

(iv)



(d)

Cylinder

Marks (4)

Q 25 Draw the nets that can be used to make the shapes mentioned below.

- (i) Cube (ii) Cylinder
(iii) Cone (iv) Pyramid

Marks (4)

Q 26 What will happen to volume of a cube of side 10 cm, if its each edge is

- (a) doubled? (b) halved? (c) tripled?

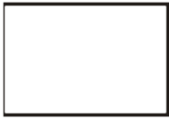
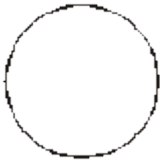
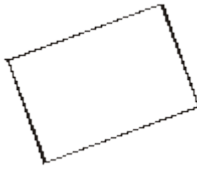
Marks (6)

Most Important Questions

Q 1 Name the two dimensional given figure.



Q 2 Which figure does represent circle?

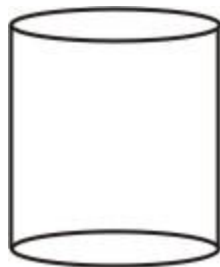
- (a)  (b) 
(c)  (d) 

Q 3 Give some examples of the two-dimensional figures.

Q 4 Give some examples of the three-dimensional figures.

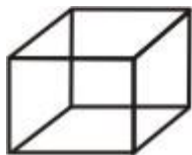
Q 5 Flat surfaces of a solid shape are called its edges. (True/False)

Q 6 A cube has Diagonals.

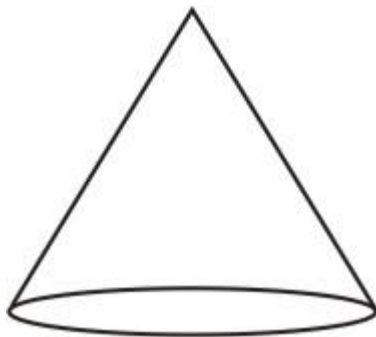


Q 7 Make a net for the given cylinder.

Q 8 Make a net for the given cube.



Q 9 Make a net for the given cone.



Q 10 What solid do you get when you give a vertical cut of brick of dimensions $2\text{ cm} \times 2\text{ cm} \times 4\text{ cm}$ along 4 cm side.

Q 11 How many types of sketches of a solid are possible. Name them.

Q 12 What is an oblique sketch.

Q 13 What is an isometric sketch.

Q 14 Draw an isometric sketch of a cuboid of dimensions $4 \times 3 \times 3$.

Q 15 Draw an oblique sketch of a cuboid of dimensions $3 \times 1 \times 3$.

Q 16 If two cuboids of dimensions $3\text{ cm} \times 3\text{ cm} \times 6\text{ cm}$ are placed height by height, what would be the dimensions of the resulting figure be?

Q 17 How an object which is in 3D can be viewed in different ways. Name all the ways.

Q 18 Name the three views of a solid.

Q 19 What do you mean by visualising solid shapes.

Q 20 Keep torchlight, right in front of a cube. What is the shadow that you obtained?

Q 21 Give three views of the given figure.

