STUDY MATERIAL

IX Maths

DETAILS OF THE CONCEPTS TO BE MASTERED BY EVERY CHILD OF CLASS IX WITH EXERCISE AND EXAMPLES OF NCERT TEXT BOOKS.

Symbols used

* Important Questions

** Very Important Questions

*** Very Very Important Questions

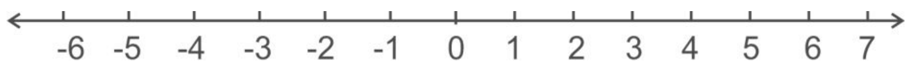
S. No.	Topic	Concept	Degree of Importance	NCERT Book
1.	Number System	Rational Numbers	**	Example - 2 Ex. 1.1 Q: 2, 3
		Irrational Numbers	**	Example 3, 4 Ex. 1.2 Q 3
		Real Numbers and their decimal expansion and number line	***	Example 7, 8, 9, 11 Ex. 1.3 Q 3, 7, 8 Ex. 1.4 Q 1, 2
		Operations on Real Numbers	***	Example 18, 19, 20 Ex. 1.5 Q: 4, 5
		Laws of Exponents for Real Numbers	*	Example 21 Q: 2, 3
2.	Polynomials	Polynomials in one variable and zeroes of a polynomial	*	Ex. 2.1 Q 5 Example 2, 4, 5 Ex. 2.2 Q 2, 4
		Remainder Theorem	***	Example 6, 7, 9 Q: 1, 2
		Factorization of Polynomial	***	Example 12, 13, 14, 15 Ex. 2.4 Q 1, 2, 4, 5
		Algebraic Identities	***	Example 17, 18, 20, 21, 22, 23, 24 Ex. 2.5 Q2, 4, 5, 6, 9, 11, 12, 13, 14

3.	Coordinate Geometry	Cartesian System	**	Example 2 Ex. 3.2 Q: 2
		Plotting a Point in the Plane	***	Example 3 Ex. 3.3 Q 1, 2
4.	Introduction to Euclid's Geometry	Axioms and Postulates	*	Example 1 Ex. 5.1 Q: 2, 4, 6 Ex. 5.2 Q: 2
5.	Lines and Angles	Basic Terms and Definition	**	Example 1, 3 Ex. 6.1 Q: 3, 5
		Parallel Lines and a transversal	**	Example 4, 6 Ex. 6.2 Q: 3, 4, 5
		Angle Sum Property of a triangle	***	Example 7, 8 Ex.: 7.1 Q: 1, 3, 5, 7, 8
		Properties of congruency of triangles	**	Example 4, 5, 6 Ex. 7.2 Q: 2, 4, 5, 6 Ex. 7.3 Q: 2, 4
		Inequalities in a triangle	*	Example 9 Ex. 7.4 Q: 2, 3, 5
7.	Heron's Formula	Area of triangle by Heron's Formula	*	Example 1, 3 Ex. 12.1Q: 4, 5, 6
		Application of Heron's Formula	***	Example 6 Ex. 12.2 Q: 1, 2, 5, 9

Chapter - 1 (Term-I)

(Number System)

Key Concepts



* Natural numbers are - 1, 2, 3, …………….. denoted by N.
* Whole numbers are - 0, 1, 2, 3, ……………… denoted by W.
* Integers - ……. -3, -2, -1, 0, 1, 2, 3, ……………… denoted by Z.
* Rational numbers - All the numbers which can be written in the form p/q, $\neq 0$ are called rational numbers where p and q are integers.
* Irrational numbers - A number s is called irrational, if it cannot be written in the form p/q where p and q are integers and $\neq 0$.
* The decimal expansion of a rational number is either terminating or non terminating recurring. Thus we say that a number whose decimal expansion is either terminating or non terminating recurring is a rational number.
* The decimal expansion of a irrational number is non terminating non recurring.
* All the rational numbers and irrational numbers taken together.
* Make a collection of real number.
* A real no is either rational or irrational.
* If r is rational and s is irrational then r+s, r-s, r.s are always irrational numbers but r/s may be rational or irrational.
* Every irrational number can be represented on a number line using Pythagoras theorem.
* Rationalization means to remove square root from the denominator.

  $\frac{3+\sqrt{5}}{\sqrt{2}}$ to remove we will multiply both numerator & denominator by $\sqrt{2}$

  $\frac{1}{a \pm \sqrt{b}}$ its rationalization factor $a \mp \sqrt{b}$

Section - A

Q.1 Is zero a rational number? Can you write in the form p/q, where p and q are integer and $q \neq 0$?

Q.2 Find five rational numbers between $\frac{3}{5} and \frac{4}{5}$?

Q.3 State whether the following statements are true or false give reasons for your answers.

(i) Every natural no. is whole number.

(ii) Every integer is a whole number.

(iii) Every rational number is a whole number.

(iv) Every irrational number is a real number.

(v) Every real number is an irrational number.

(vi) Every point on the number line is of the form $\sqrt{m}$ where m is a natural no's.

Q.4 Show how $\sqrt{5}$ can be represented on the number line?

Section - B

Q.5 Find the decimal expansion of $\frac{10}{3}, \frac{7}{8}$ $and \frac{1}{7}$? What kind of decimal expansion each has.

Q.6 Show that 1.272727 = $1.\overline{27}$ can be expressed in the form p/q, where p and q are integers and $q \neq 0$.

Q.7 Write three numbers whose decimal expressions are non-terminating & non recurring?

Q.8 Find three different rational between 3/5 and 4/7.

Q.9 Classify the following numbers as rational or irrational.

(a) $\sqrt{23}$ (b) $\sqrt{225}$ (c) 0.6796

(d) 1.101001000100001….

Section - C

Q.10 Visualize 3.765 on the number line using successive magnification.

Q.11 Visualize $4.\overline{26}$ on the number line upto 4 decimal places.

Q.12 simplify the following expressions.

(i) $\left(5+\sqrt{7}\right)(2+\sqrt{5})$

(ii) $\left(5+\sqrt{5}\right)(5-\sqrt{5})$

(iii) $\left(\sqrt{3}+\ \sqrt{7}\right)^2$

(iv) $\left(\sqrt{11}-\sqrt{7}\right)\ (\sqrt{11}+\sqrt{7})$

Q.13 Rationalize the denominator of $\frac{5}{\sqrt{3}-\sqrt{5}}$.

Section - D

Q.1 Represent $\sqrt{9.3}$ on number line.

Q.2 Recall, π is defined as the ratio of the circumference (say c) of a circle to its diameter (say d). That is$\pi = c/d$. This seems to contradict the fact that π is irrational. How will you resolve this contradiction?

Q.3 Simplify

(i) $2^{2/3}.2^{1/5}$

(ii) $\left(\frac{1}{3^7}\right)^7$

(iii) $(16)^{\frac{3}{4}}$

(iv) $7^{1/2}8^{1/2}$

Self Evaluation

Q.1 Write the value of

$\left(\frac{x^a}{x^b}\right)^{a+b} \times \left(\frac{x^b}{x^c}\right)^{b+c} \times \left(\frac{x^c}{x^a}\right)^{c+a}$

Q.2 $\left\{5\left(8^{\frac{1}{3}}+27^{\frac{1}{3}}\right)^3\right\}^{\frac{1}{4}}$

Q.3 If a & b are rational number, find the value of a & b in each of the following equalities.

(a) $\frac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$ (ii) $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}$

Q.4 Prove that $\sqrt{2}$ is an irrational number using long division method?

Chapter - 2

(Polynomials)

Key Concepts

Constants : A symbol having a fixed numerical value is called a constant.

Example : 7, 3, -2, 3/7, etc. are all constants.

Variables : A symbol which may be assigned different numerical values is known as variable.

Example : $C = 2\pi\, r$ C - circumference of circle

r - radius of circle

Where 2 & π are constants. while C and r are variable

Algebraic expressions : A combination of constants and variables. Connected by some or all of the operations +, -, X and ÷ is known as algebraic expression.

Example : $4 + 9x - 5x^2y + \frac{3}{8}xy$ etc.

Terms : The several parts of an algebraic expression separated by '+' or '-' operations are called the terms of the expression.

Example : $x^3 + 2x^2y + 4xy^2 + y^3 + 7$ is an algebraic expression containing 5 terms $x^3, 2x^3y,\ -4xy^2,\ y^3$ & 7

Polynomials : An algebraic expression in which the variables involved have only non-negative integral powers is called a polynomial.

(i) $5x^3 - 4x^2 - 6x - 3$ is a polynomial in variable x.

(ii) $5 +\ 8x^{3/2} +\ 4x^{-2}$ is an expression but not a polynomial.

Polynomials are denoted by $p(x),\quad (x) and\ r(x) etc.$

Coefficients : In the polynomial $x^3 + 3x^2 + 3x + 1$, coefficient of $x^3, x^2, x\ are\ 1, 3, 3$ respectively and we also say that +1 is the constant term in it.

Degree of a polynomial in one variable : In case of a polynomial in one variable the highest power of the variable is called the degree of the polynomial.

Classification of polynomials on the basis of degree.

	degree	Polynomial	Example
(a)	1	Linear	$x+1,\ 2x+3\ etc.$
(b)	2	Quadratic	ax^2+bx+c etc.
(c)	3	Cubic	x^3-3x^2+1 etc.
(d)	4	Biquadratic	x^4-1

Classification of polynomials on the basis of no. of terms

	No. of terms	Polynomial & Examples.
(i)	1	Monomial - $5, 3x, \frac{1}{3}y$ etc.
(ii)	2	Binomial - $(3+6x),\ (x-5y)$ etc.
(iii)	3	Trinomial- $2x^2+4x+2$ etc.

Constant polynomial : A polynomial containing one term only, consisting a constant term is called a constant polynomial the degree of non-zero constant polynomial is zero.

Zero polynomial : A polynomial consisting of one term, namely zero only is called a zero polynomial.

The degree of zero polynomial is not defined.

Zeroes of a polynomial : Let $p(x)$ be a polynomial. If $p(\alpha)=0,$ then we say that α is a zero of the polynomial of p(x).

Remark : Finding the zeroes of polynomial p(x) means solving the equation p(x)=0.

Remainder theorem : Let $f(x)$ be a polynomial of degree $n \geq 1$ and let a be any real number. When $f(x)$ is divided by $(x-a)$ then the remainder is $f(a)$

Factor theorem : Let $f(x)$ be a polynomial of degree $n > 1$ and let a be any real number.

(i) If $f(a) = 0\ then\ (x-a) is\ factor\ of\ f(x)$

(ii) $If\ (x-a) is\ a\ factor\ of\ f(x)\ then\ f(a)=0$

Factor : A polynomial $p(x)$ is called factor of $q(x),\ if\ p(x)$ divides $q(x)$ exactly.

Factorization : To express a given polynomial as the product of polynomials each of degree less than that of the given polynomial such that no such a factor has a factor of lower degree, is called factorization.

Example : $x^2 - 16 = (x + 4)(x - 4)$

Methods of Factorization :

Factorization by taking out the common factor

e.g.

$$36q^3b - 60a^2bc = 12a^2b\,(3a - 5c)$$

Factorizing by grouping

$$\begin{aligned} ab + bc + ax + cx &= (ab + bc) + (ax + cx) \\ &= b\,(a + c) + x\,(a + c) \\ &= (a + c)\,(b + x) \end{aligned}$$

Factorization of quadratic trinomials by middle term splitting method.

$$\begin{aligned} x^2 + bc + c &= x^2 + (p + q)x + pq \\ &= (x + p)(x + q) \end{aligned}$$

Identity : Identity is a equation (trigonometric, algebraic) which is true for every value of variable.

Some algebraic identities useful in factorization:

(i) $(x + y)^2 = x^2 + 2xy + y^2$

(ii) $(x - y)^2 = x^2 - 2xy + y^2$

(iii) $x^2 - y^2 = (x - y)(x + y)$

(iv) $(x + a)(x + b) = x^2 + (a + b)x + ab$

(v) $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$

(vi) $(x + y)^3 = x^3 + y^3 + 3xy\,(x + y)$

(vii) $(x - y)^3 = x^3 - y^3 - 3xy(x - y)$

(viii) $x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

$x^3 + y^3 + z^3 = 3xyz \quad if \;\; x + y + z = 0$

Section - A

Q.1 Which of the following expressions is polynomial?

(i) $x^5 - 2x^3 + x + 7$ (ii) $y^3 - \sqrt{3}y$

(iii) $5\sqrt{z} - 6$ (iv) $x - \frac{1}{x}$ (v) $x^{108} - 1$

(vi) $\sqrt[3]{x} - 27$ (vii) $x^{-2} + 2x^{-1} + 3$

Q.2 Write the degree of each of the following polynomial.

(i) $2x - \sqrt{5}$ (ii) $3 - x + x^2 - 6x^3$ (iii) 9

(iv) $8x^4 - 36x + 5x^7$ (v) $x^9 - x^5 + 3x^{10} + 8$ (vi) $2 - 3x^2$

Q.3 (i) Give an example of a binomial of degree 27.

(ii) Give an example of a monomial of degree 16.

(iii) Give an example of trinomial of degree 3.

Section - B

Q.4 If $p(x) = 5 - 4x + 2x^2$ $find\ (i)\ p(0)\ (ii)\ p(3)\ (iii)\ p(-2)$

Q.5 Find the zeros of the polynomials given below :

(i) $p(x) = x - 5$ (ii) $(x) = x + 4$ (iii) $h(x) = 6x - 1$

(iv) $p(x) = ax + b$ (v) $r(x) = x^2 + 3x$ (vi) $l(x) = x^2 + 2x + 1$

Q.6 Find the remainder when $f(x) = 12x^3 - 13x^2 - 5x + 7$ is divided by $(3x + 2)$?

Q.7 Show that $(x + 5)$ is a factor of the polynomial

$f(x) = x^3 + x^2 + 3x + 115$

Q.8 Find the value of a for which $(x - a)$ is a factor of the polynomial.

$f(x) = x^5 - a^2x^3 + 2x + a - 3$

Section - C

Q.9 Factorize the following expressions.

(i) $5x^2 - 20xy$

(ii) $5a\ (b + c) - 7b\ (b + c)$

(iii) $x(x - y)^2 + 3x^2y\ (x - y)$

(iv) $6ab - b^2 + 12ac - 2bc$

(v) $x^2 + \frac{1}{x^2} + 2 - 2x - \frac{2}{x}$

Q.10 Factorize :

(i) $9x^2 - 16y^2$ (ii) $x^3 - x$

Q.11 Factorize:

$a(a - 1) - b\ (b - 1)$

Q.12 Factorize following expressions.

(i) $x^2 + 9x + 18$

(ii) $x^2 - 4x - 21$

(iii) $x^2 - 9x + 18$

(iv) $x^2 - 19x + 78$

Q.13 Calculate $(997)^2$ using algebraic identities.

Q.14 Calculate 103 X 107 using algebraic identities.

Q.15 Expand $(2a + 3b + 4c)^2$.

Q.16 Factorize $4x^2 + y^2 + z^2 - 4xy - 2yz + 4xz$.

Q.17 Expand (i) $(4a + 5b)^3$ (ii) $(5x - 3y)^3$

Q.18 Evaluate (i) $(95)^3$ (ii) $(106)^3$

Q.19 Factorize (i) $x^3 + 64$ (ii) $27x^3 + 125y^3$

(iii) $8a^3 - 27b^3$ (iv) $1 - 64a^3$

Section - D

Q.20 Factorize

$a^3 + 27b^3 + 8c^3 - 18abc$

Q.21 Factorize

$(p - \quad)^3 + (q - r)^3 + (r - p)^3$

Q.22 Find the product

$(3x - 5y - 4)(9x^2 + 25y^2 + 15xy + 12x - 20y + 16)$

Q.23 If $If\ x + y + z = 9\ and\ xy + yz + zx = 23$ then find the value of

$(x^3 + y^3 + z^3 - 3xyz)$?

Self Evaluation

Q.24 Which of the following expression is a polynomial?

(a) $\sqrt{x} - 1$ (b) $\frac{x-1}{x+1}$ (c) $x^2 - \frac{2}{x^2} + 5$ (d) $x^2 + \frac{2x^{3/2}}{\sqrt{x}} + 6$

Q.25 Degree of zero polynomial is

(a) 1 (b) 0 (c) not defined (d) none of these

Q.26 For what value of k is the polynomial $p(x) = 2x^3 - kx^2 + 3x + 10$ exactly divisible by $(x + 2)$?

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

Q.27 The zeroes of the polynomial $p(x) = 3x^2 - 1\ are$

(a) $\frac{1}{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $\frac{-1}{\sqrt{3}}$ (d) $\frac{1}{\sqrt{3}}\ and\ \frac{-1}{\sqrt{3}}$

Q.28 If $\frac{x}{y} + \frac{y}{x} = -1$ where $x \neq 0,\ y \neq 0\ \ then\ find\ the\ value\ of\ x^3 - y^3$.

Q.29 If $(x + 2) and\ (x - 1) are\ factors\ of\ (x^3 + 10x^2 + m\,x + n)$ then find value of m & n?

Q.30 Find the value of $(369)^2 - (368)^2$

Q.31 Find value of 104 X 96

Q.32 If $a + b + c = 0$ find value of $\left(\frac{a^2}{bc} + \frac{b^2}{ca} + \frac{c^2}{ab}\right)$?

Answers

Q.1 (i), (ii), (v)

Q.2 (i) 1 (ii) 3 (iii) 0 (iv) 4 (v) 9 (vi) 2

Q.4 (i) p (0) = 5 (ii) p(3) = 11 (iv) 21

Q.5 (i) $x = 5$ (ii) $x = -4$ (iii) x= 1/6 (iv) $x = -b/a$

(v) $x = 0, x = -3$ (vi) $x = -1, -1$

Q.6 remainder = 1

Q.8 a = 1

Q.9 (i) $5x(x - 4y)$

(ii) $(b + c)(5a - 7b)$

(iii) $x(x - y)[(x - y) + 3xy]$

(iv) $(b + 2c)(6a - b)$

(v) $\left(x + \frac{1}{x}\right)\left(x + \frac{1}{x} - 2\right)$

Q.10 (i) $(3x + 4y)\ (3x - 4y)$ (ii) $x(x + 1)(x - 1)$

Q.11 (a-b) (a+b-1)

Q.12 (i) $(x + 6)(x + 3)$

(ii) $(x - 7)(x + 3)$

(iii) $(x - 6)(x - 3)$

(iv) $(x - 6)(x - 13)$

Q.13 994009

Q.14 11021

Q.15 $4a^2 + 9b^2 + 16c^2 + 12ab + 24bc + 16ac$

Q.16 $(2x - y + z)^2$

Q.17 (i) $64a^3 + 125b^3 + 240a^2b + 300ab^2$

(ii) $125x^3 - 27y^3 - 225x^2y + 135xy^2$

Q.18 (i) 857375 (ii) 1191016

Q.19 (i) $(x + 4)(x^2 - 4x + 16)$

(ii) $(3x+5y)(9x^2-15xy+25y^2$

(iii) $(2a - 3b)(4a^2 + 6ab + 9b^2)$

(iv) $(1-4a)(1+4a+16a^2)$

Q.20 $(a+3b+2c)(a^2+9b^2+4c^2-3ab-6bc-2ac)$

Q.21 $3(p-q)(q-r)(r-p)$

Q.22 $27x^3-125y^3-64-180xy.$

Q.23 108

Q.24 $(d)\ x^2+\frac{2x^{\frac{3}{2}}}{x^{\frac{1}{2}}}+6$

Q.25 (c) not defined

Q.26 (d) -3

Q.27 (d) $\frac{1}{\sqrt{3}}$ & $\frac{-1}{\sqrt{3}}$

Q.28 0

Q.29 m = 7, n = -18

Q.30 737

Q.31 9984

Q.32 3

Chapter - 3

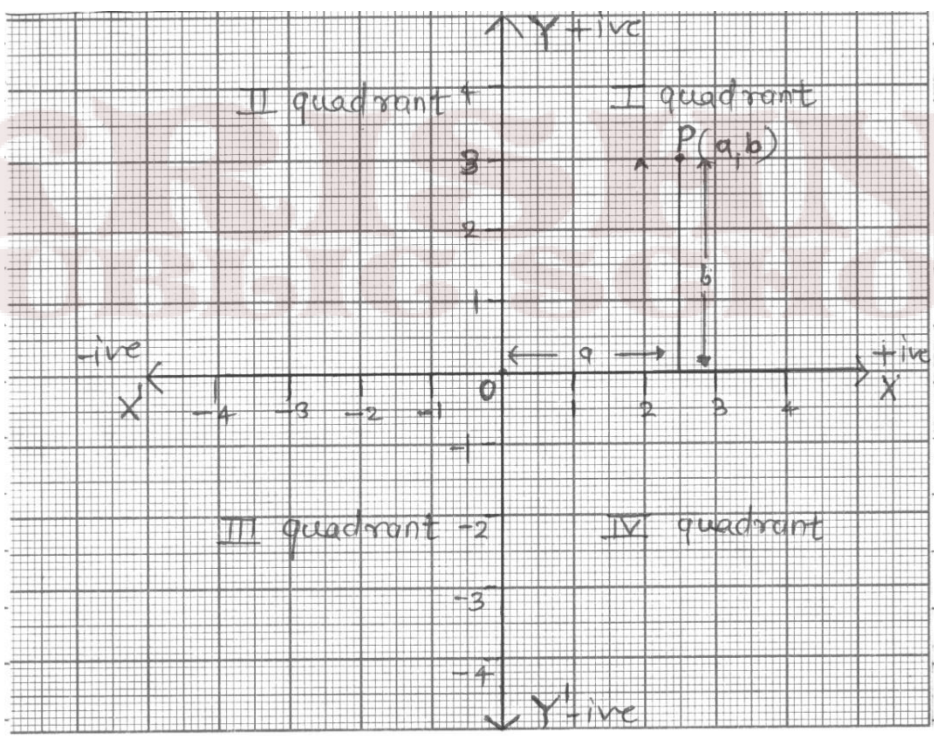
(Coordinate Geometry)

Key concepts

Coordinate Geometry : The branch of mathematics in which geometric problems are solved through algebra by using the coordinate system is known as coordinate geometry.

Coordinate System

Coordinate axes: The position of a point in a plane is determined with reference to two fixed mutually perpendicular lines, called the coordinate axes.



In this system, position of a point is described by ordered pair of two numbers.

Ordered pair : A pair of numbers a and b listed in a specific order with 'a' at the first place and 'b' at the second place is called an ordered pair (a,b)

Note that

$$(a, b) \neq (b, a)$$

Thus (2,3) is one ordered pair and (3,2) is another ordered pair.

In given figure O is called origin.

The horizontal line X^1OX is called the X-axis.

The vertical line YOY' is called the Y-axis.

P(a,b) be any point in the plane. 'a' the first number denotes the distance of point from Y-axis and 'b' the second number denotes the distance of point from X-axis.

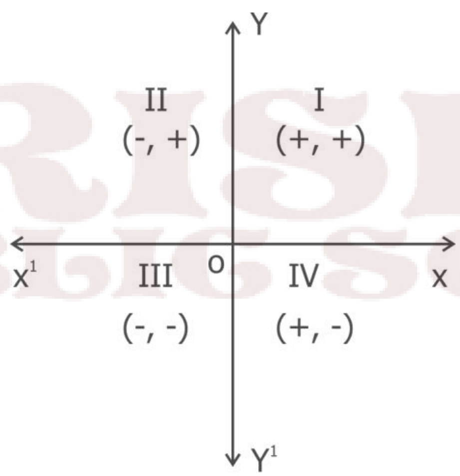
a - X - coordinate | abscis of P.

b - Y - coordinate | ordinate of P.

The coordinates of origin are (0,0)

Every point on the x-axis is at a distance o unit from the X-axis. So its ordinate is 0.

Every point on the y-axis is at a distance of unit from the Y-axis. So, its abscis is 0.



Note : Any point lying on $X - axis$ or Y-axis does not lie in any quadrant.

Section - A

Q.1 On which axes do the given points lie?

(i) (7, 0) (ii) (0, -3) (iii) (0, 6) (iv) (-5, 0)

Q.2 In which quadrants do the given points lie?

(i) (4, -2) (ii) (-3, 7) (iii) (-1, -2) (iv) (3, 6)

Q.3 Is P (3, 2) & Q(2, 3) represent the same point?

Q.4 In which quadrant points P(3,0), Q(6,0) , R (-7.0), S (0,-6), lie?

Q.5 If a<0 and b<0, then the point P(a,b) lies in

(a) quadrant IV (b) quadrant II (c) quadrant III (d) quadrant I

Q.6 The points (other than the origin) for which the abscis is equal to the ordinate lie in

(a) Quadrant I only (b) Quadrant I and II

(c) Quadrant I & III (d) Quadrant II only.

Q.7 The perpendicular distance of the point P(4,3) from the y axis is

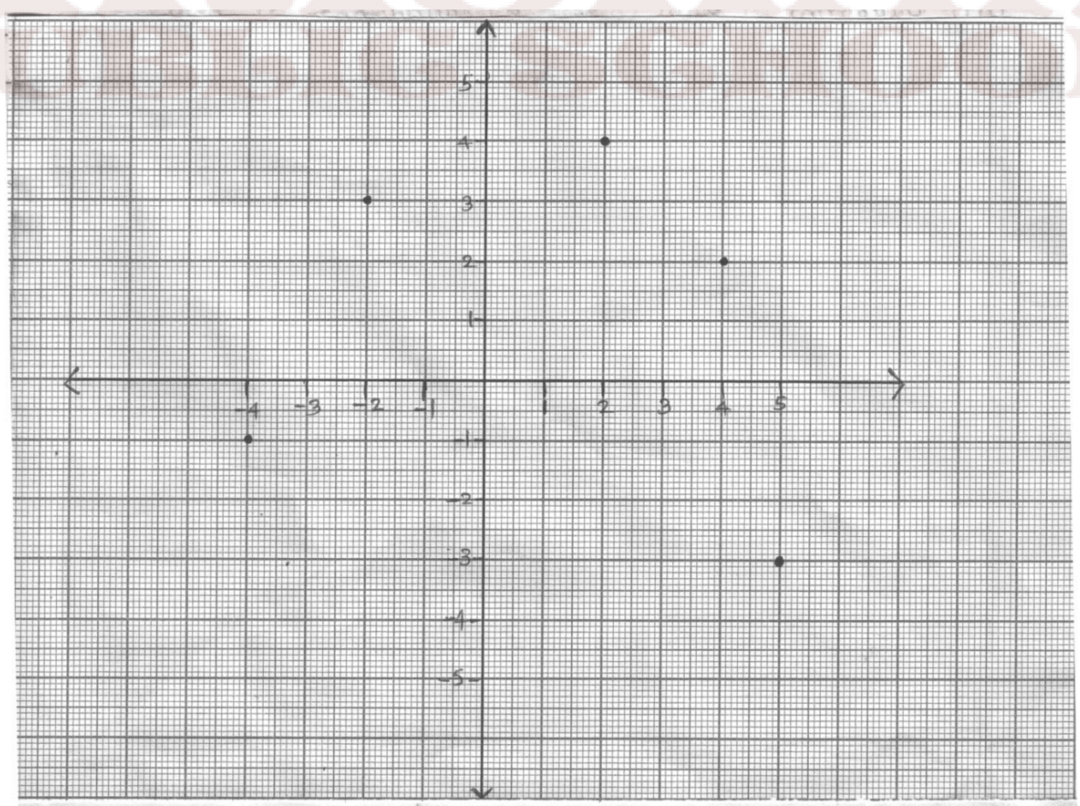
(a) 3 Units (b) 4 Units (c) 5 Units (d) 7 Units

Q.8 The area of triangle OAB with 0(0,0), A(4,0) & B(0,6) is

(a) 8 sq. unit (b) 12 sq. units (c) 16 sq. units (d) 24 sq. units

Section - B

Q.9 Write down the coordinates of each of the points P,Q, R, S and T as shown in the following figure?



Q.10 Draw the lines X'OX and YOY[1] as the axes on the plane of a paper and plot the given points.

(i) A(5,3) (ii) B (-3, 2) (iii) C(-5, -4) (iv) D(2,-6)

Section - C

Q.11 Find the mirror images of the following point using x-axis & y-axis as mirror.

(i) A(2,3)

(ii) B(2,-3)

(iii) C(-2,3)

(iv) D(-2,-3)

Q.12 Draw the graph of the following equations

(i) $y = 3x + 2$ (ii) $y = x$

Q.13 Draw a triangle with vertices 0(0,0) A(3,0) B(3,4). Classify the triangle and also find its area.

Q.14 Draw a quadrilateral with vertices A(2,2) B(2,-2) C(-2,-2), D(-2,2). Classify the quadrilateral and also find its area.

Q.15 Find the coordinates of point which are equidistant from these two points P(3,0) and Q(-3,0). How many points are possible satisfying this condition?

Answers

Q.1 (i) (7,0) X-axis (ii) (0, -3) Y-axis (iii) (0,6) Y-axis (iv) (-5,0) X-axis

Q.2 (i) (4,-2) IV quadrant (ii) (-3,7) II quadrant (iii) (-1,-2) III quadrant

(iv) (3,6) I quadrant.

Q.3 P(3,2) and Q(2,3) do not represent same point.

Q.4 These points do not lie in any quadrant. These points lie on the axes.

Q.5 (c) quadrant III Q.6 (c) quadrant I & III

Q.7 (a) 3 units Q.8 (b) 12 sq. units.

Q.11 A^1(2,-3),B^1(2,3),C^1(-2,-3),D^1(-2,3)

Q.13 right angle triangle area - 6 square units.

Q.14 quadrilateral is square area -16 square units.

Q.15 Every point on Y-axis satisfy this condition.

Chapter - 5

(Introduction to Euclid's Geometry)

The Greeks developed geometry is a systematic manner Euclid (300 B.C.) a greek mathematician, father of geometry introduced the method of proving mathematical results by using deductive logical reasoning and the previously proved result. The Geometry of plane figure is know as "Euclidean Geometry".

Axioms :

The basic facts which are taken for granted without proof are called axioms some Euclid's axioms are

(i) Things which are equal to the same thing are equal to one another. i.e.

$a = b, \quad b = c \implies a = c$

(ii) If equals are added to equals, the wholes are equal i.e. $a = b \Longrightarrow a + c = b + c$

(iii) If equals are subtracted from equals, the remainders are equal i.e.

$a = b \implies a - c = b - c$

(iv) Things which coincide with one another are equal to one another.

(v) The whole is greater than the part.

Postulates :

Axioms are the general statements, postulates are the axioms relating to a particular field.

Educlid's five postulates are.

(i) A straight line may be drawn from any one point to any other point.

(ii) A terminated line can be produced indefinitely.

(iii) A circle can be drawn with any centre and any radius.

(iv) All right angles are equal to one another.

(v) If a straight line falling on two straight lines makes the interior angles on the same side of it taken together less than two right angles, then the two straight lines, if produced indefinitely meet on that side on which the angles are less than two right angles.

Statements : A sentence which is either true or false but not both, is called a statement.

eg. (i) 4+9=6 If is a false sentence, so it is a statement.

(ii) Sajnay is tall. This is not a statement because he may be tall for certain persons and may not be taller for others.

Theorems : A statement that requires a proof is called a theorem.

eg. (i) The sum of the angles of triangle is 180^0.

(ii) The angles opposite to equal sides of a triangles are equal.

Corollary - Result deduced from a theorem is called its corollary.

Section - A

(1) Euclid stated that if equals are subtracted from equals, the remainders are equals in the forms of

(a) an axiom (b) a postulate

(c) a definition (d) a proof Ans.(a)

(2) Euclid stated that all right angles are equals to each other in the form of

(a) an axiom (b) a definition(c) a postulate(d) a proof Ans.(c)

(3) Which of the following needs a proof:

(a) Theorem (b) Axiom(c) Definition (d) Postulate Ans.(a)

(4) The number of dimensions, a solid has

(a) 1 (b) 2 (c) 3 (d) 0 Ans.(c)

(5) The number of dimensions a surface has :

(a) 1 (b) 2 (c) 3 (d) 0 Ans.(b)

(6) The number of dimensions, a point has

(a) 0 (b) 1 (c) 2 (d) 3 Ans.(a)

(7) Which one of the following statement is true?

(a) Only one line can pass through a single point.

(b) There are infinite number of lines which pass through two distinct points.

(c) Two distinct lines cannot have more than one point in common.

(d) If two circles are equal, then their radii are not equal. Ans.(c)

(8) Euclid divided his famous treatise "The Element" into

(a) 13 chapters (b) 12 Chapters

(c) 11 Chapters (d) 9 Chapters Ans.(a)

(9) Thales belongs to the country.

(a) Babylonia (b) Egypt (c) Greece (d) Rome Ans.(c)

Section - B

(10) If AB=CD can you say that AC=BD?

Give reasons for your answer.

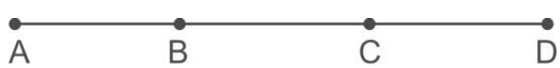
(11) In how many points two distinct lines can intersect.

(12) In how many lines two distinct planes can intersect.

Section - C

(13) If a point C lies between two points A and B such that AC=CB then prove that $AC = \frac{1}{2} AB$. Explain by drawing the figure.

(14) In the figure, AC=BD prove that AB=CD.



(15) If C is called a mid point of line segment AB. Prove that every line segment has one and only one mid point.

(16) Define the following terms :

(i) Parallel lines (ii) Concurrent lines (iii) Intersecting lines

(17) State Euclid's any three postulates.

(18) State Euclid's any three axioms.

Chapter - 6

(Lines and Angles)

Key Concepts

(1) Point - We often represent a point by a fine dot made with a fine sharpened pencil on a piece of paper.

(2) Line - A line is completely known if we are given any two distinct points. Line AB is represented by as $\overleftrightarrow{AB}$. A line or a straight line extends indefinitely in both the directions.

(3) Line segment - A part (or portion) of a line with two end points is called a line segment.

(4) Ray - A part of line with one end point is called a ray.

(5) Collinear points - If three or more points lie on the same line, they are called collinear points otherwise they are called non-collinear points.

Types of Angles -

(1) **Acute angle -** An acute angle measure between 0^0 and 90^0.

(2) **Right angle -** A right angle is exactly equal to 90^0.

(3) **Obtuse angle -** An angle greater than 90^0 but less than 180^0.

(4) **Straight angle -** A straight angle is equal to 180^0.

(5) **Reflex angle -** An angle which is greater than 180^0 but less than 360^0 is called a reflex angle.

(6) **Complementary angles -** Two angles whose sum is 90^0 are called complementary angles.

(7) **Supplementary angle -** Two angles whose sum is 180^0 are called supplementary angles.

(8) **Adjacent angles -** Two angles are adjacent, if they have a common vertex, a common arm and their non common arms are on different sides of common arm.

(9) **Linear pair -** Two angles form a linear pair, if their non-common arms form a line.

(10) Vertically opposite angles - Vertically opposite angles are formed when two lines intersect each other at a point.

TRANSVERSAL

(a) Corresponding angles

(b) Alternate interior angles

(c) Alternate exterior angles

(d) Interior angles on the same side of the transversal.

* If a transversal intersects two parallel lines, then

  (i) each pair of corresponding angles is equal.

  (ii) each pair of alternate interior angles is equal.

  (iii) each pair of interior angle on the same side of the transversal is supplementary.

* If a transversal interacts two lines such that, either

  (i) any one pair of corresponding angles is equal, or

  (ii) any one pair of alternate interior angles is equal or

  (iii) any one pair of interior angles on the same side of the transversal is supplementary then the lines are parallel.

* Lines which are parallel to a given line are parallel to each other.

* The sum of the three angles of a triangle is 180^0.

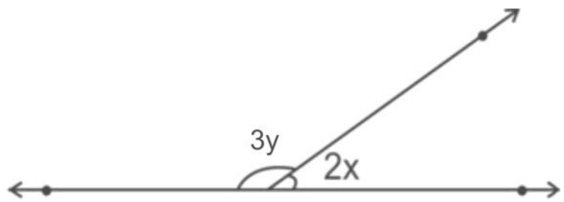
* If a side of a triangle is produced, the exterior angle so formed is equal to the sum of the two interior opposite angles.

Section - A

Q.1 In the given figure, $x = 30^0$

The value of y is

(a) 10^0 (b) 40^0 (c) 36^0 (d) 45^0



Q.2 An exterior angle of a triangle is 75^0 and its two interior opposite angles are equal. Each of these equal angles is

(a) 105^0 (b) 50.5^0 (c) 52^0 (d) 37.5^0

Q.3 The compliment of an angle 'm' is:

(a) m (b) 90^0+m (c) 90^0-m (d) m X 90^0

Q.4 If one angle of a triangle is equal to the sum of the other two equal angles, then the triangle is

(a) an isosceles triangle (b) an obtuse triangle

(c) an equilateral triangle (d) a right triangle

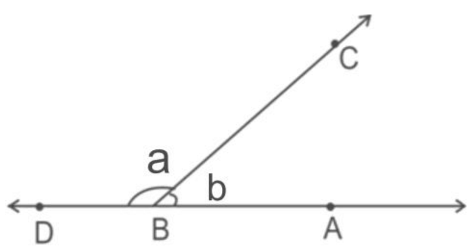
Q.5 In the given figure $\angle a \ and \ \angle b$

form a linear pair if a-b = 100^0

then a and b are

(a) 120^0, 20^0 (b) 40^0, 140^0

(c) 50^0, 150^0 (d) 140^0, 40^0



Q.6 Angle of a triangle are in the ratio 2 : 4 : 3. The smallest angle of the triangle is

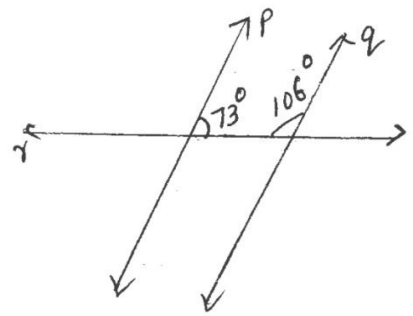
(a) 60^0 (b) 40^0 (c) 80^0 (d) 20^0

Section - B

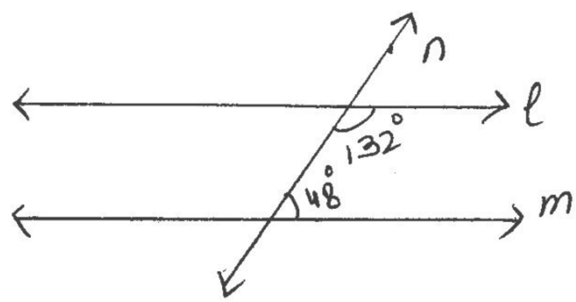
Q.7 Two adjacent angles are equal. Is it necessary that each of these angles will be a right angle? Justify your answer.

Q.8 In the following figures which of the two lines are parallel and why?

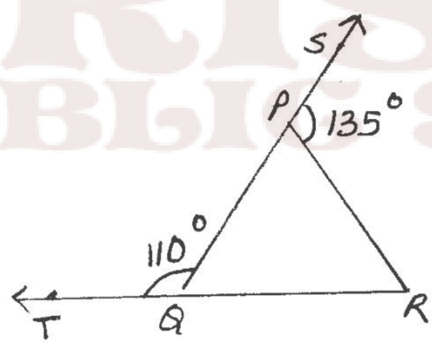
(i)



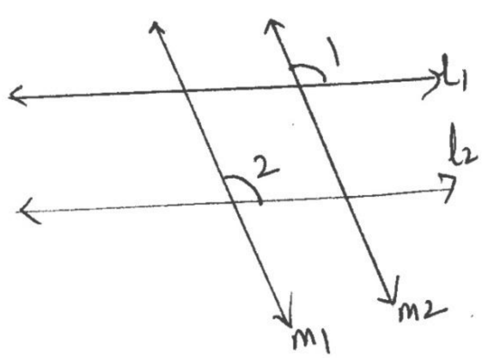
(ii)



Q.9 In the given fig. sides QP and RQ of ΔPQR are produced to point S and T respectively. If $\angle PQT = 110^0$ and $\angle SPR = 135^0$ find $\angle PRQ$

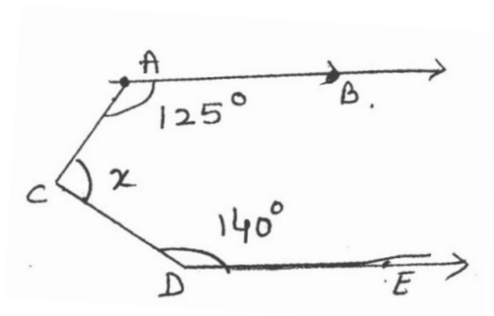


Q.10 In the fig. $l_1 \parallel l_2$ and $m_1 \parallel m_2$ if $\angle 1 = 115^0$ $find$ $\angle 2$



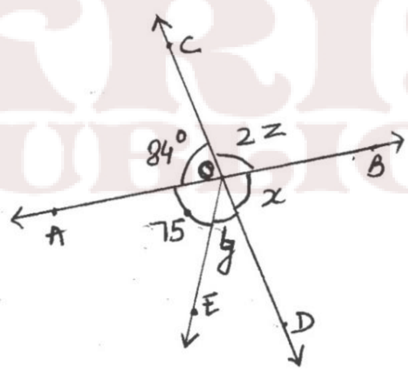
Q.11 Sum of two angles of a triangle is 90^0 and their difference is 50^0. Find all the angles of the triangle.

Q.12 In the adjoining figure, $AB \parallel DE$, find the value of x.



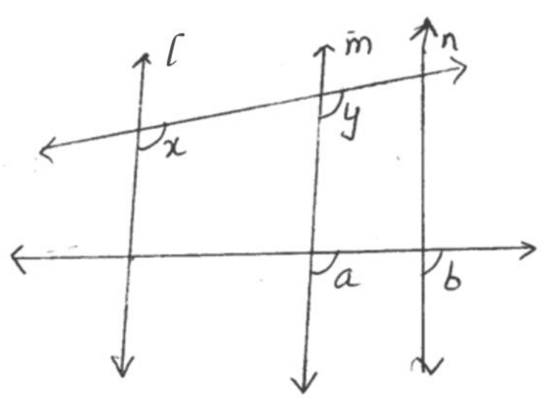
Section - C

Q.13 In the given figure AB and CD intersect each other at O. If $\angle AOE = 75^0$ find the value of x, y and z.

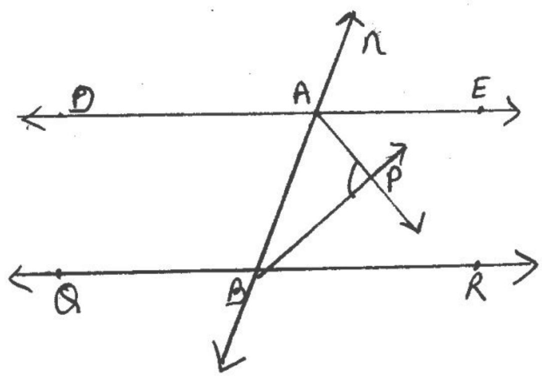


Q.14 Prove that vertically opposite angle are equal.

Q.15 In the given figure $x = y$ and $a = b$ prove that $l \parallel n$

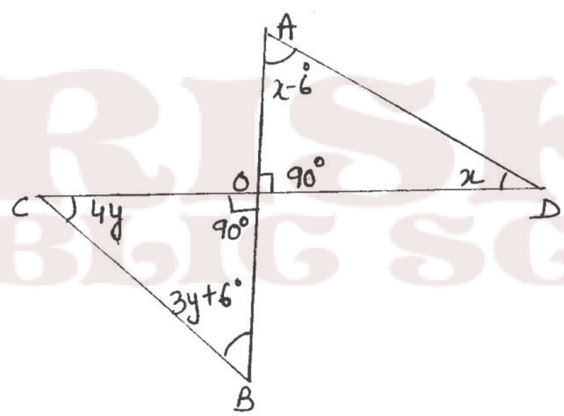


Q.16 In the given figure $DE \parallel QR$ and AP and BP are bisectors of $\angle EAB$ and $\angle RBA$ respectively find $\angle APB$

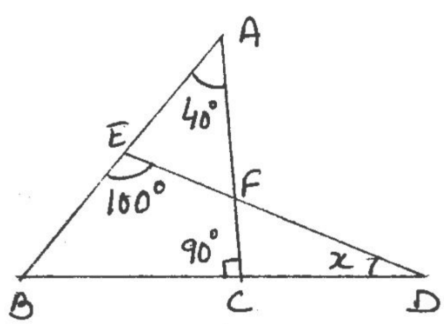


Q.17 The angles of a triangle are in the ratio 2: 3: 5 find the angles of the triangle.

Q.18 Find x and y in the following figure.



Q.19 In figure find x.



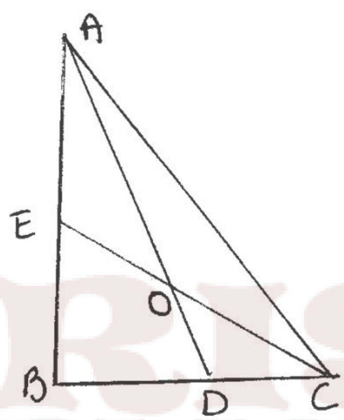
Section - D

Q.20 Prove that sum of the angles of triangle is 180^0.

Q.21 Prove that sum of the angles of a hexagon is 720^0.

Q.22 The angles of a triangle are $(x - 40^0),\ (x - 20^0)\ and\ \left(\frac{1}{2}x - 10\right)^0$ find the value of x.

Q.23 In the given figure, AD and CE are the angle bisectors of $\angle A\ and\ \angle C$ respectively If $\angle ABC = 90^0\ then\ find\ \angle AOC$



Q.24 A transversal intersects two parallel lines. Prove that the bisectors of any pair of corresponding angle so formed are parallel.

Answer :

(1) b (2) d (3) c (4) a,d (5) d (6) b

(9) 65^0 (10) 115^0 (11) $20^0, 70^0, 90^0$ (12) 95^0 (13) $84^0, 21^0, 48^0$ (16) 90^0

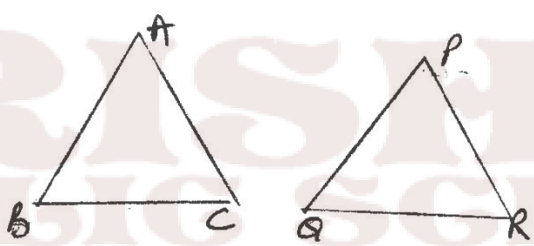
(17) $36^0, 54^0, 90^0$ (18) $48^0, 12^0$ (19) 30^0 (22) 100^0

(23) 135^0

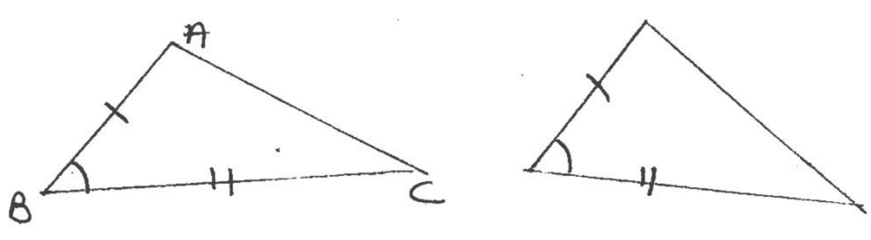
Chapter - 7

(Triangles)

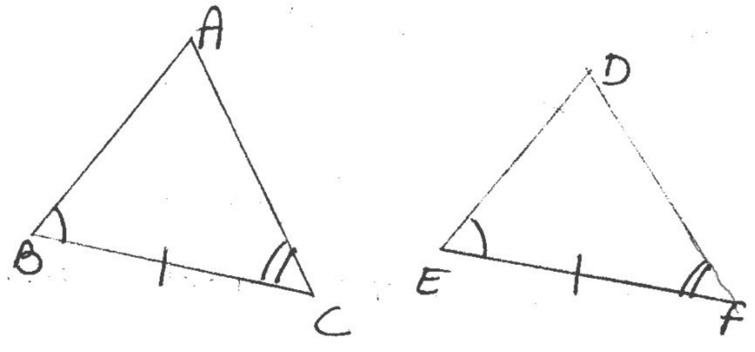
- Triangle - A closed figure formed by three intersecting lines is called a triangle. A triangle has three sides, three angles and three vertices.
- Congruent figures - Congruent means equal in all respects or figures whose shapes and sizes are both the same for example, two circles of the same radii are congruent. Also two squares of the same sides are congruent.
- Congruent Triangles - two triangles are congruent if and only if one of them can be made to superpose on the other, so as to cover it exactly.
- If two triangles ABC and PQR are congruent under the correspondence $A \leftrightarrow P, B \leftrightarrow Q$ and $C \leftrightarrow R$ then symbolically, it is expressed as $\Delta ABC \cong \Delta PQR$



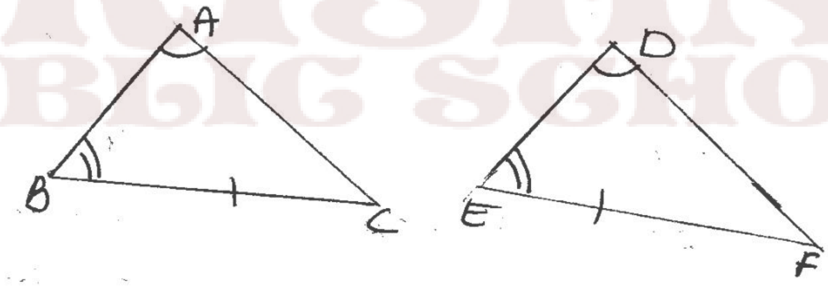
- In congruent triangles corresponding parts are equal and we write 'CPCT' for corresponding parts of congruent triangles.
- SAS congruency rule - Two triangles are congruent if two sides and the included angle of one triangle are equal to the two sides and the included angle of the other triangle. For example ΔABC and ΔPQR as shown in the figure satisfy SAS congruent criterion.



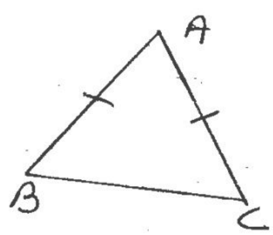
- A Congruence Rule - Two triangles are congruent if two angles and the included side of one triangle are equal to two angles and the included side of other triangle. For examples $\Delta ABC\ and\ \Delta DEF$ shown below satisfy A congruence criterion.



- AAS Congruence Rule - Two triangle are congruent if any two pairs of angles and one pair of corresponding sides are equal for example $\Delta ABC\ and\ \Delta DEF$ shown below satisfy AAS congruence criterion.

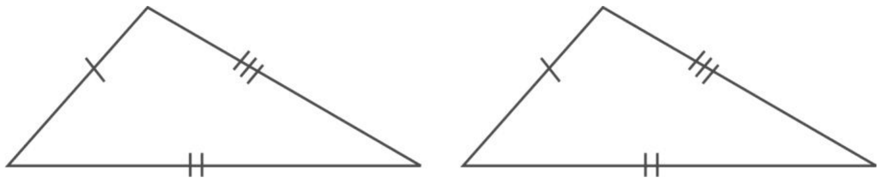


- AAS criterion for congruence of triangles is a particular case of A criterion.
- Isosceles Triangle - A triangle in which two sides are equal is called an isosceles triangle. For example ΔABC shown below is an isosceles triangle with AB=AC.

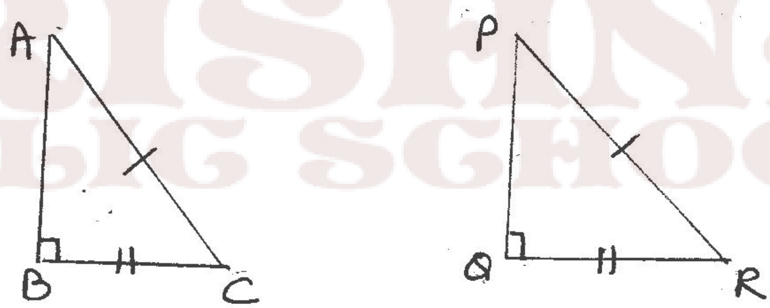


- Angle opposite to equal sides of a triangle are equal.

- Sides opposite to equal angles of a triangle are equal.
- Each angle of an equilateral triangle is 60^0.
- SSS congruence Rule - If three sides of one triangle are equal to the three sides of another triangle then the two triangles are congruent for example $\Delta ABC\ and\ \Delta DEF$ as shown in the figure satisfy SSS congruence criterion.



- RHS Congruence Rule - If in two right triangles the hypotenuse and one side of one triangle are equal to the hypotenuse and one side of the other triangle then the two triangle are congruent. For example $\Delta ABC\ and\ \Delta PQR$ shown below satisfy RHS congruence criterion.



RHS stands for right angle - Hypotenuse side.

- A point equidistant from two given points lies on the perpendicular bisector of the line segment joining the two points and its converse.
- A point equidistant from two intersecting lines lies on the bisectors of the angles formed by the two lines.
- In a triangle, angle opposite to the longer side is larger (greater)
- In a triangle, side opposite to the large (greater) angle is longer.
- Sum of any two sides of a triangle is greater than the third side.

Section - A

Q.1 Which of the following is not a criterion for congruence of triangles?

(a) SAS (b) S (c) A (d) SSS

Q.2 If AB=QR, BC=PR and CA=PQ then

(a) $\Delta ABC \cong \Delta PQR$ (b) $\Delta CBA \cong \Delta PRQ$

(c) $\Delta BAC \cong \Delta RPQ$ (d) $\Delta PQR \cong \Delta BCA$

Q.3 In Δ PQR, if $\angle R > \angle Q$ then

(a) $QR > PR$ (b) $PQ > PR$ (c) $PQ < PR$ (d) $QR < PR$

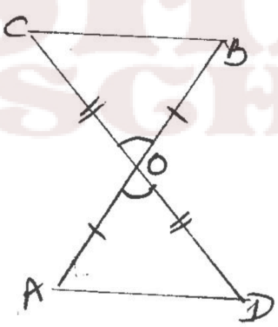
Q.4 $\Delta ABC \cong \Delta DEF\ and\ if\ AB = 3 = DE$ and BC = EF = 4 then necessary condition is

(a) $\angle A = \angle D$ (b) $\angle B = \angle E$ (c) $\angle C = \angle F$ (d) $CA = FD$

Q.5 In the given figure, if OA=OB, OD=OC then $\Delta AOD \cong \Delta BOC$ by congruence rule.

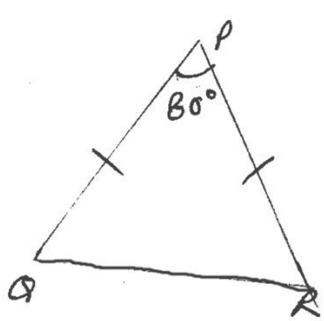
(a) SSS (b) A

(c) SAS (d) RHS



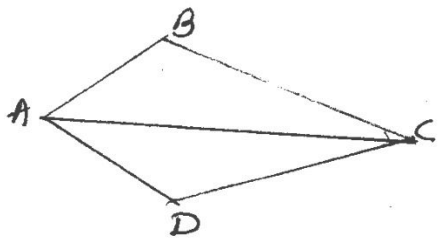
Q.6 In the figure if PQ=PR and $\angle P = 80^0$, then measure of Q is

(a) 100^0 (b) 50^0 (c) 80^0 (d) 40^0



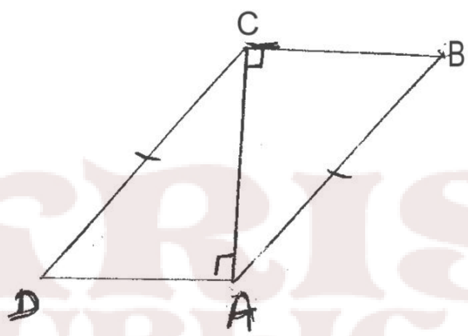
Q.7 In the figure $\Delta ABC \cong \Delta ADC, if\ \angle ACB = 25^0\ and\ \angle B = 125^0, then\ \angle CAD\ is$

(a) 25^0 (b) 65^0 (c) 30^0 (d) 75^0



Q.8 In the figure, if $\Delta ABC \cong \Delta CDA$, the property of congruence is

(a) SSS (b) SAS (c) RHS (d) A



Q.9 It is not possible to construct a triangle when its sides are

(a) 8.3cm, 3.4cm, 6.1cm (b) 5.4cm, 2.3cm, 3.1cm

(c) 6cm, 7cm, 10cm (d) 3cm, 5cm, 5cm

Q.10 In a $\Delta\ ABC$, if AB=AC and BC is produced to D such that $\angle ACD = 100^0$ then $\angle A$

(a) 20^0 (b) 40^0 (c) 60^0 (d) 80^0

Q.11 If $\Delta PQR \cong \Delta EFD, then\ \angle E =$

(a) $\angle P$ (b) $\angle Q$ (c) $\angle R$ (d) None of these

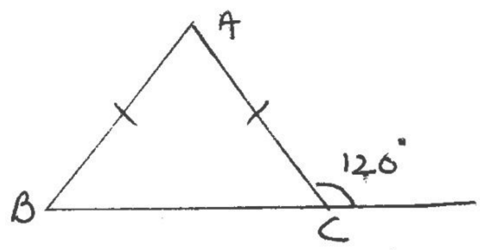
Q.12 If $\Delta PQR \cong \Delta EFD, then\ ED =$

(a) PQ (b) QR (c) PR (d) None of these

Section - B

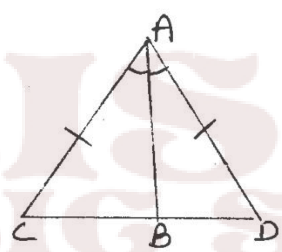
Q.13 In the figure AB=AC and

$\angle ACD = 120^0$ $find$ $\angle A$



Q.14 In a ΔABC if $\angle A = 45^0$ and $\angle B = 70^0$ determine the shortest and largest sides of the triangle.

Q.15 In the given figure AB is bisector of $\angle A$ and AC=AD Prove that BC=BD and $\angle C = \angle D$



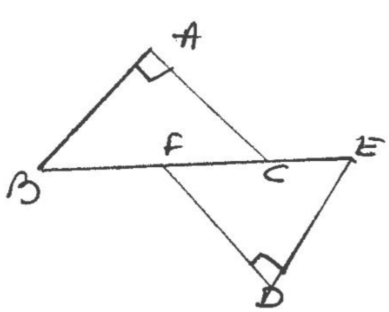
Q.16 AD is an altitude of an isosceles triangle ABC is which AB=AC. Prove that $\angle BAD = \angle DAC$

Q.17 In an acute angled ΔABC , S is any point on BC. Prove that AB+BC+CA > 2AS

Q.18 In the given figure $BA \perp AC, DE \perp DF$

such that BA=DE and BF=EC

show that $\Delta ABC \cong \Delta DEF$

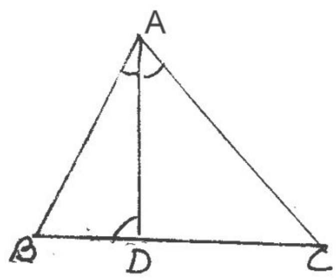


Q.19 Q is a point on the side SR of A ΔPSR such that PQ=PR. Prove that PS>PQ

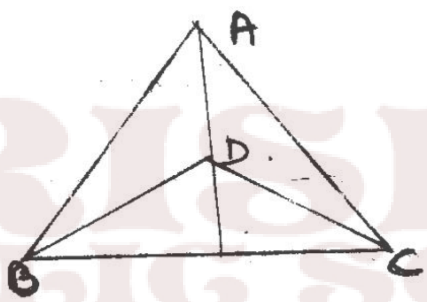
Section - C

Q.20 In the given figure if AD is the bisector of $\angle A$ show that

(i) AB>BD (ii) AC>CD

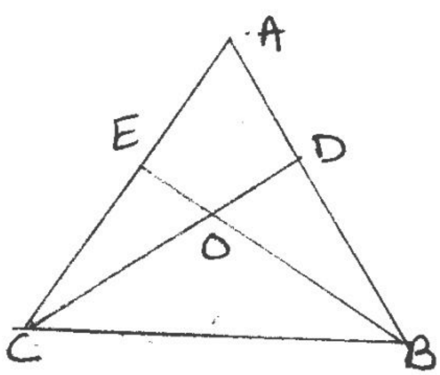


Q.21 In the given figure AB=AC, D is the point is the interior of ΔABC such that $\angle DBC = \angle DCB$ Prove that AD bisects $\angle BAC \ of \ \Delta ABC$



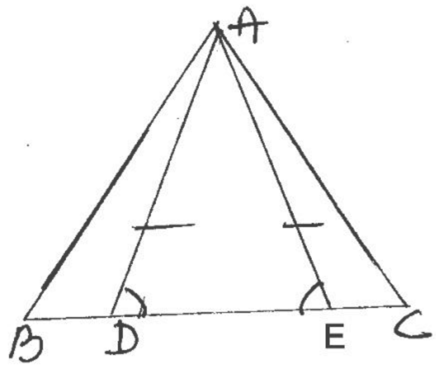
Q.22 Prove that if two angles of a triangle are equal then sides opposite to them are also equal.

Q.23 In the figure, it is given that AE=AD and BD=CE. Prove that $\Delta AEB \cong \Delta ADC$



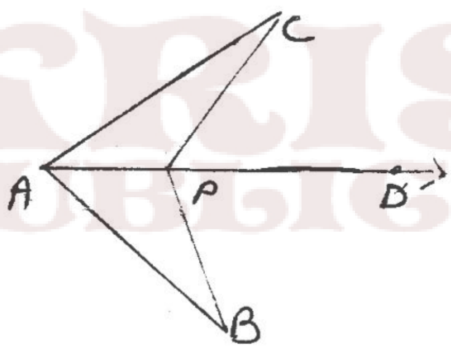
Q.24 Prove that angles opposite to two equal sides of a triangle are equal.

Q.25 In the figure AD=AE and D and E are points on BC such that BD=EC Prove that AB=AC



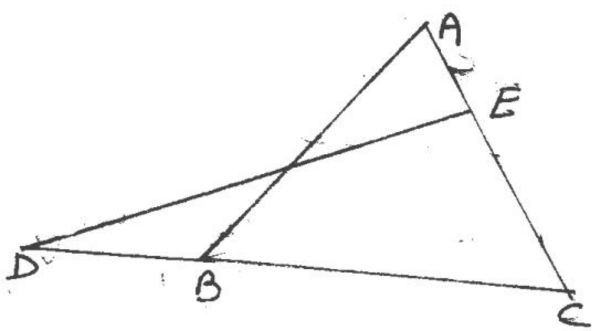
Q.26 Prove that medians of an equilateral triangle are equal.

Q.27 In the given figure $\angle CPD = \angle BPD$ and AD is the bisector of $\angle BAC$. Prove that $\Delta BAP \cong \Delta CAP$ and hence BP=CP

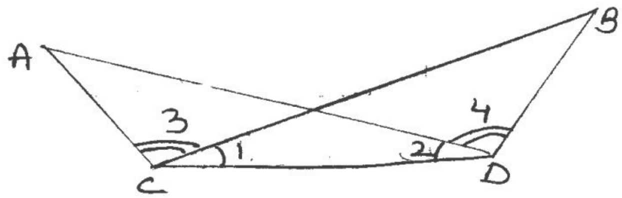


Section - D

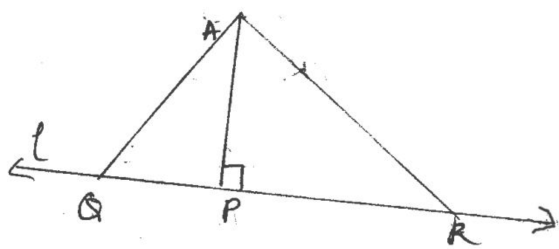
Q.28 In the figure $\angle B = \angle C$ show that AE > AF



Q.29 In the figure $\angle BCD = \angle ADC$ and $\angle ACB = \angle BDA$. Prove that AD=BC and $\angle A = \angle B$

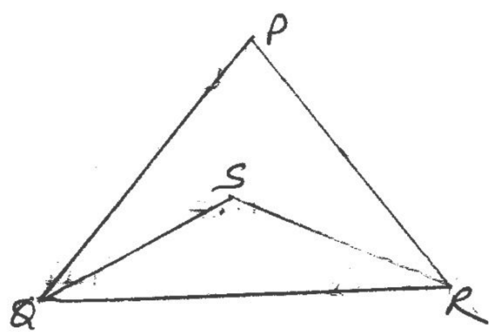


Q.30 In the given figure $AP \perp l$ and PR > PQ. Show that AR > AQ



Q.31 Prove that if in two triangles two angles and the included side of one triangle are equal to two angles and the included side of the other triangle, then the two triangles are congruent.

Q.32 In the given figure PQR is a triangle and S is any point in its interior, show that SQ + SR < PQ + PR



Answers :

(1) b	(2) b	(3) b	(4) b	(5) c	(6) b
(7) c	(8) c	(9) b	(10) a	(11) a	(12) c
(13) 60^0	(14) BC, AC				

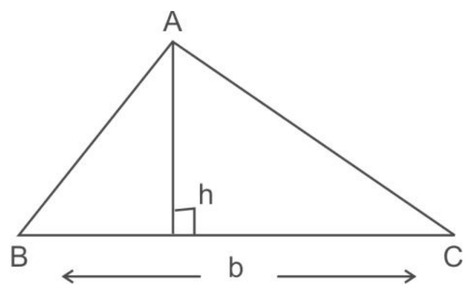
Chapter - 12

(Heron's Formula)

Key Concept

* Triangle with base 'b' and altitude 'h' is

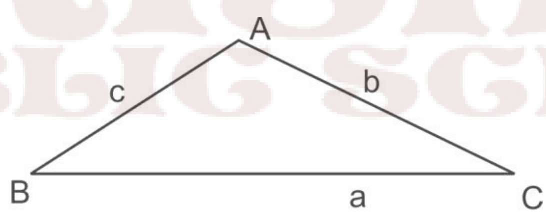
  Area = $\frac{1}{2} \times (b \times h)$



* Triangle with sides a, b and c

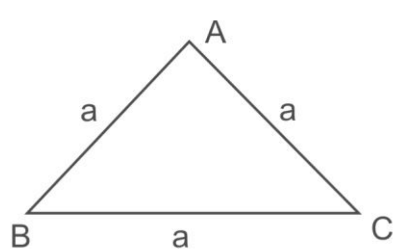
  (i) Semi perimeter of triangle s = $\frac{a+b+c}{2}$

  (ii) Area = $\sqrt{s(s-a)(s-b)(s-c)}$ square units.



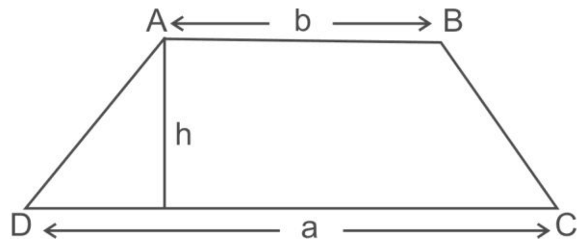
* Equilateral triangle with side 'a'

  Area = $\frac{\sqrt{3}}{4}\, a^2$ square units



* Trapezium with parallel sides 'a' and 'b' and the distance between two parallel sides as 'h'.

Area = $\frac{1}{2}(a+b)\,h$ square units



Section - A

(1) An isosceles right triangle has an area 8cm^2. The length of its hypotenuse is

(a) $\sqrt{16}\ cm$ (b) $\sqrt{48}\ cm$ (c) $\sqrt{32}\ cm$ (d) $\sqrt{24}\ cm$

(2) The sides of a triangle are 35cm, 54cm, and 61cm, respectively. The length of its longest altitude is

(a) $26\sqrt{5}\ cm$ (b) 28 cm (c) $10\sqrt{5}\ cm$ (d) $24\sqrt{5}\ cm$

Q.3 The sides of a triangle are 56cm, 60cm. and 52cm. long. The area of the triangle is.

(a) 4311 cm^2 (b) 4322 cm^2 (c) 2392 cm^2 (d) None of these

Q.4 The area of an equilateral triangle is $16\sqrt{3}$ m^2. Its perimeter is

(a) 24m (b) 12m (c) 306 m (d) 48m

Q.5 The perimeter of a triangle is 30cm. Its sides are in the ratio 1 : 3 : 2, then its smallest side is.

(a) 15cm (b) 5cm (c) 1 cm (d) 10cm.

Section - B

Q.6 Find the area of a triangular garden whose sides are 40m., 90m and 70m.

(use $\sqrt{5}$ = 2.24)

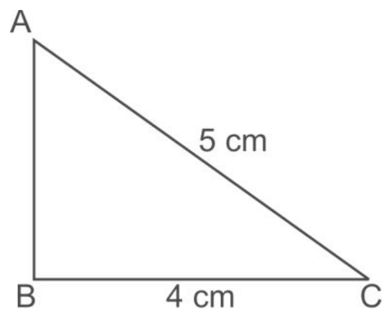
Q.7 Find the cost of leveling a ground in the form of a triangle with sides 16m, 12m and 20m at Rs. 4 per sq. meter.

Q.8 Find the area of a triangle, two sides of which are 8cm and 11cm and the perimeter is 32 cm.

Q.9 The area of an isosceles triangle is $12cm^2$. If one of its equal side is 5cm. Find its base.

Q.10 Find the area of a right triangle whose sides containing the right angle are 5cm and 6cm.

Q.11 Find the area of the adjoin figure if $AB \perp BC$



Section - C

Q.12 The diagonals of a rhombus are 24cm and 10cm. Find its area and perimeter.

Q.13 Two side of a parallelogram are 10cm and 7cm. One of its diagonals is 13cm. Find the area.

Q.14 A rhombus shaped sheet with perimeter 40 cm and one diagonal 12cm, is painted on both sides at the rate of ` 5 per m^2. Find the cost of painting.

Q.15 The sides of a quadrilateral ABCD are 6cm, 8cm, 12cm and 14cm (taken in order) respectively, and the angle between the first two sides is a right angle. Find its area.

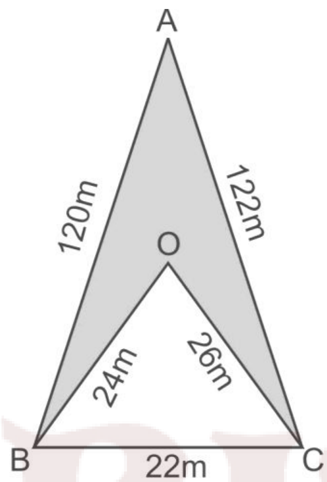
Q.16 The perimeter of an isosceles triangle is 32cm. The ratio if the equal side to its base is 3 : 2. Find the area of the triangle.

Q.17 The sides of a triangular field are 41m, 40m and 9m. Find the number of flower beds that can be prepared in the field, if each flower bed needs $900cm^2$ space.

Q.18 The perimeter of a triangular ground is 420m and its sides are in the ratio 6 : 7 : 8. Find the area of the triangular ground.

Section - D

Q.19 Calculate the area of the shaded region.



Q.20 If each sides of a triangle is double, then find the ratio of area of the new triangle thus formed and the given triangle.

Q.21 A field is in the shape of a trapezium whose parallel sides are 25m and 10m. If its non-parallel sides are 14m and 13m, find its area.

Q.22 An umbrella is made by stitching 10 triangular pieces of cloth of 5 different colour each piece measuring 20cm, 50cm and 50cm. How much cloth of each colour is required for one umbrella? $\left(\sqrt{6} = 2.45\right)$

Q.23 A triangle and a parallelogram have the same base and some area. If the sides of the triangle are 26cm, 28cm and 30cm and the parallelogram stands on the base 28cm, find the height of the parallelogram.

Answer

Q. 1 (c) $\sqrt{32}\ cm$

Q. 2 (d) $24\sqrt{5}\ cm$

Q. 3 (d) None of these

Q. 4 (a) 24 m.

Q. 5 (b) 5 cm.

Q. 6 1344 sq. m.

Q. 7 ` 384

Q. 8 $8\sqrt{30}\ cm^2$

Q. 9 6cm.

Q. 10 15cm^2

Q. 11 6cm^2

Q. 12 120 sqcm., 52 cm.

Q. 13 $40\sqrt{3}\ cm^2$

Q. 14 ` 960

Q.15 $24(\sqrt{6}+1)$ cm^2

Q.16 $32\sqrt{2}\ cm^2$

Q.17 2000

Q. 18 $2100\sqrt{15}\ m^2$

Q.19 1074m^2

Q. 21 196 sq. m.

Q.22 980 cm^2 each.

Q. 23 12cm.

Activities / Projects Term - I

(1) Construct a square root spiral.

(2) Represent irrational number $\sqrt{2}$ on the number line.

(3) Verify the Identity.

$$(a+b+c)^2 - a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$$

(4) Verify the Identity.

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^2$$

(5) Verify experimentally that if two lines intersect, then

(i) The sum of all the four interior angles is 360^0.

(ii) The sum of two adjacent angles is 180^0.

(6) Verify that the sum of the angles of a triangle is 180^0.

(7) Verify that the exterior angle is equal to sum of interior opposite angle.

(8) Verify experimentally the different criteria for congruency of triangles using different triangular cut out shapes.

(9) Verify experimentally that in a triangle, the longer side has the greater angle opposite to it.

(10) Design a crossword puzzles using mathematical terms/words.

(11) Search of various historical aspects of the number π.

(12) Collection of various objects or congruent shapes.

PART - 2

DETAILS OF THE CONCEPTS TO BE MASTERED BY EVERY CHILD OF CLASS IX WITH EXERCISE AND EXAMPLES OF NCERT TEXT BOOKS.

I

Symbols used

* - Important Questions

** - Very Important Questions

*** - Very Very Important Questions

S. No.	Topic	Concept	Degree of Importance	NCERT Book
1.	Linear Equations in two variables	Linear Equations	***	Example 2 Ex 4.1 - Q2
		Solution of Linear Equation	**	Example 4 Ex 4.2 Q - 2, 4
		Graph of a linear equation in two variables	***	Ex 4.3 Q : 1, 3, 8
		Equations of lines parallel to the x-axis and y-axis	*	Example 9 Ex. 4.4 Q : 1, 2
2.	Quadrilateral	Angle sum property of a Quadrilateral, properties of a parallelogram	***	Example: 2, 3, 5 Ex. 8.1 Q: 1, 3, 7, 9, 12
		Mid Point Theorem, Other conditions for the Quadrilaterals	**	Theorem 8.9 Ex. 8.2 Q: 2, 3, 5, 7
3.	Areas of Parallelograms and triangles	Figures on the same base and between the same parallels	*	Ex. 9.1 Q : 1
		Parallelograms on the same base and between the same parallels	**	Theorem 9.1 Example 2 Ex. 9.2 Q: 2, 3, 5
		Triangles on the same base and between the same parallels	***	Example: 3, 4 Ex. 9.3 Q: 2, 5, 7, 9

4.	Circles	Angle subtended by a chord at a point	*	Theorem 10.1 Ex. 10.2 Q: 2
		Perpendicular from the centre to a chord	**	Ex. 10.3 Q: 1, 3
		Equal Chords and their distances from the centre	***	Example 2 Ex. 10.4 Q: 2, 3, 6
		Angle subtended by an arc of a circle	**	Theorem 10.8 Example: 3, 6 Ex.10.5 Q: 2, 5, 8, 12
5.	Construction	Basic Construction	*	Ex. 11.1 Q: 2, 4
		Construction of Triangle	***	Ex. 11.2 Q: 1, 3, 5
6.	Surface areas and volumes	Surface area of a cuboid and a cube	**	Example 2 Ex. 13.1 A: 2, 5, 6, 8
		Surface Area of a Right Circular Cylinder	***	Ex. 13.2 A: 3, 5, 9, 10
		Surface Area of a Right Circular Cone	**	Example 5, 6 Ex. 13.3 Q: 3, 5, 6, 8
		Surface Area of a Sphere	**	Ex. 13.4 Q: 4, 6, 7, 9
		Volume of a Cuboid	**	Ex. 13.5 Q: 2, 6, 8, 9
		Volume of a Right Circular Cone	***	Ex. 13.7 Q: 2, 5, 7, 9
		Volume of a Sphere	**	Ex. 13.8 Q: 3, 6, 8, 9
7.	Statistics	Collection of Data	*	Ex. 13.8 Q: 3, 6, 8, 9
		Presentation of Data	***	Ex. 14.2 Q: 2, 4, 7, 9
		Graphical Representation of Data	***	Ex. 14.3 Q: 2, 4, 8, 9
		Measures of Central Tendency	***	Example 12, 14 Ex. Q: 3, 4, 5
8.	Probability	Probability an Experimental Approach	***	Example: 2, 5, 9 Ex. 15.1 Q: 2, 5, 7

Chapter - 4

(Linear Equations in two variables)

Key Concept

- An equation of the form $ax + by + c = 0$ where a, b and c are real numbers such that a and b are not both zero is called a linear equation in two variables.
- A pair of values of x and y which satisfy the equation $ax + by + c = 0$ is called a solution of the equation.
- A linear equation in two variables has infinitely many solutions.
- The graph of every linear equation in two variables is a straight line.
- y = 0 is the equation of x-axis and x = 0 is equation of y-axis.
- The graph of $x = a$ is a straight line parallel to the y-axis.
- The graph of y = a is a straight line parallel to the x-axis.
- An equation of the type y = mx represent a line passing through the origin.

Section - A

Q.1 The point (a, a) always lies on the line

(a) y = x (b) y - axis (c) x - axis (d) x + y = 0

Q.2 The point (m, -m) always lies on the line.

(a) $x = m$ (b) $y = -m$ (c) $x + y = 0$ (d) $x = y$

Q.3 If $x = -2 \ and \ y = 3$ is a solution of the equation $3x - 5y = a,$ then value of a is

(a) 19 (b) -21 (c) -9 (d) -18

Q.4 x = 3, y = -2 is a solution of the equation.

(a) $x + y = 5$ (b) $3x - 2y = 11$

(c) $4x - 3y = 18$ (d) $3x + y = 5$

Q.5 x = -5 can be written in the form of equation in two variable as

(a) $x + o.y + 5 = 0$ (b) $o.x + y = -5$

(c) $o.x + o.y = -5$ (d) $o.x + o.y = +5$

Q.6 The linear equation $3x - 2y = 5$ has

(a) a unique solution

(b) two solutions

(c) no solution

(d) infinitely many solutions.

Q.7 The equation of x-axis is

(a) $x = k$ (b) y = 0 (c) $x = 0$ (d) y = k

Q.8 Any point on the y-axis is of the form

(a) (x, y) (b) (x, x) (c) (0,y) (d) $(x, 0)$

Section - B

Q.9 Draw the graph of the equation $x - 2y = 0$

Q.10 The cost of a pen is four times the cost of a pencil express the statement as a linear equation in two variables.

Q.11 Write any four solutions for each of the following equations.

(a) $5x - 2 = 0$

(b) $3x + y = 7$

Q.12 Find the value of a if (-1, 1) is a solution of the equation $3x - ay = 5$

Q.13 If (3,1) is a solution of the equation $3x + 2y = k,$ find the value of k.

Q.14 Verify that x = 2, y = -1, is a solution of the linear equation $7x + 3y = 11$

Q.15 Write one solution of each of the following equations

(a) $4x - 3y = 0$

(b) $2y - y = 3$

Q.16 The cost of 2 pencils is same as the cost of 5 erasers. Express the statement as a linear equation in two variables.

Section - C

Q.17 Give the geometrical representation of the equation y = 3 as an equation.

(i) In one variable

(ii) In two variables

Q.18 Ramesh is driving his car with a uniform speed of 80 km/hr. Draw the time distance graph. Form the graph find the distance travelled by him in.

(i) $1\frac{1}{2}\ hr$ (ii) 3 hours

Q.19 Draw the graph of each of the equations $2x - 3y + 5 = 0$ and $5x + 4y + 1 = 0$ and find the coordinates of the point where the lines meet.

Q.20 Draw the graph of the equation $5x + 6y - 28 = 0$ and check whether the point (2,3) lies on the line.

Q.21 The taxi fare in a city is as follows: For the first kilometer, the fare is Rs. 8 and for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs. y, writes a linear equation for this information, and draw its graph.

Q.22 Write three solutions for the equation $7x - 8y = 13$

Answer

Q.1	a	Q.2	c	Q.3	b	Q.4	c	Q.5	a	Q.6	d
Q.7	b	Q. 8	c	Q.19 (-1, 1)		Q.20	Yes				

Chapter - 8

(Quadrilaterals)

Key Concept

(1) Sum of the angles of a quadrilateral is 360^0.

(2) A diagonals of a parallelogram divides it into two congruent triangles.

(3) In a parallelogram

(a) diagonals bisects each other.

(b) opposite angles are equal.

(c) opposite sides are equal

(4) Diagonals of a square bisects each other at right angles and are equal, and vice-versa.

(5) A line through the mid-point of a side of a triangle parallel to another side bisects the third side. (Mid point theorem)

(6) The line through the mid points of sides of a Δ, $\parallel$ to third side and half of it.

Section - A

Q.1 The figures obtained by joining the mid-points of the sides of a rhombus, taken in order, is

(a) a square (b) a rhombus

(c) a parallelogram (d) a rectangle

Q.2 The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O, if $\angle DAC = 32^0$ and $\angle AOB = 72^0$

then $\angle DBC$ is

(a) 32^0 (b) 24^0 (c) 40^0 (d) 63^0

Q.3 In a square ABCD, the diagonals AC and BD bisect at 0. Then ΔAOB is

(a) acute angled (b) right angled

(c) obtuse angled (d) equilateral

Q.4 ABCD is a rhombus such that $\angle ACB = 40^0$ then $\angle ADB$ is

(a) 40^0 (b) 45^0 (c) 50^0 (d) 60^0

Q.5 A quadrilateral ABCD is a parallelogram if

(a) AD || BC (b) AB = CD

(c) AB = AD (d) $\angle A = 60^0,\ \angle C = 60^0,\ \angle B = 120^0$

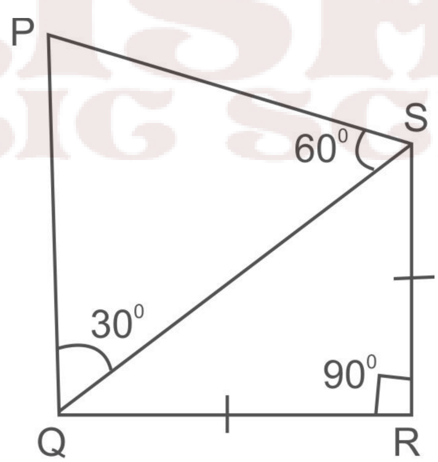
Q.6 Three angles of a quadrilateral are 60^0, 70^0 and 80^0. The fourth angle is

(a) 150^0 (b) 160^0 (c) 140^0 (d) None of these

Section - B

Q.7 In the adjoining figure QR=RS

Find $\angle PSR$



Q.8 Prove that the sum of the four angles of a quadrilateral is 360^0.

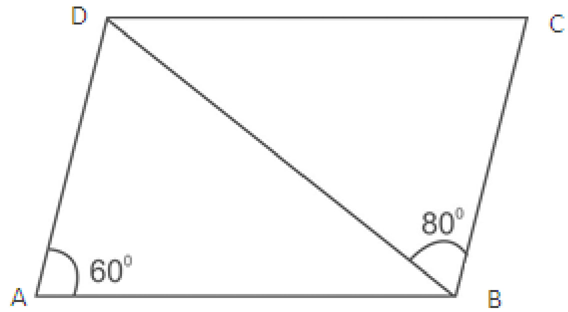
Q.9 Prove that the diagonals of a parallelogram bisects each other.

Q.10 The angles of quadrilateral are in the ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.

Q.11 ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.

Q.12 In the adjoining figure, ABCD is a ||gm. If $\angle DAB = 60^0$ and $\angle DBC = 80^0$.

Find $\angle CDB$ and $\angle ADB$.



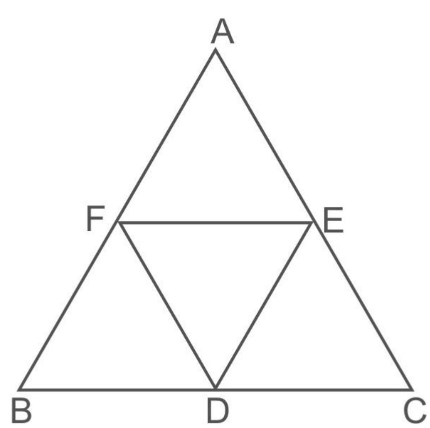
Section - C

Q.13 Prove that the line segment joining the mid-points of two sides of a triangle is parallel to the third side.

Q.14 ABCD is a rectangle and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.

Q.15 Prove that the straight line joining the mid-points of the diagonals of a trapezium is parallel to the parallel sides and is equal to half their difference.

Q.16 In the adjoining figure, D, E and F are mid-points of the sides BC, CA and AB of $\Delta ABC,$ If AB = 4.3cm, BC = 5.6cm and AC = 3.5cm, find the perimeter of ΔDEF



Q.17 In a parallelogram ABCD, AP and CQ are drawn perpendiculars from vertices A and C on diagonal BD. Prove that $\Delta APB \cong \Delta CQD$

Q.18 In a parallelogram ABCD, E and F are points on AB and CD such that AE = CE.

Prove that ED||BF.

Section - D

Q.19 If a line is parallel to the base of a trapezium and bisects one of the non-parallel sides, then prove that it bisects either diagonal of the trapezium.

Q.20 AD is a median of ΔABC and E is the mid-point of AD. BE Produced meets AC in F. Prove that $AF = \frac{1}{3} AC$

Q.21 ABC is a triangle right angled at C. A line through the mid-point M of hypotenuse AB and parallel to BC intersects AC at D. Show that

(i) D is the mid-point of AC

(ii) CM = $MA = \frac{1}{2}AB$

Q.22 Show that the bisectors of angles of a parallelogram form a rectangle.

Answers -

Q.1 (d) Rectangle

Q,2 (c) 40^0

Q.3 (b) Right angled

Q.4 (c) 50^0

Q.5 (d) $\angle A = 60^0,\ \angle C = 60^0,\ \angle B = 120^0$

Q.6 (a) 150^0

Q. 7 $\angle PSR = 105^0$

Chapter - 9

(Area of parallelograms and triangles)

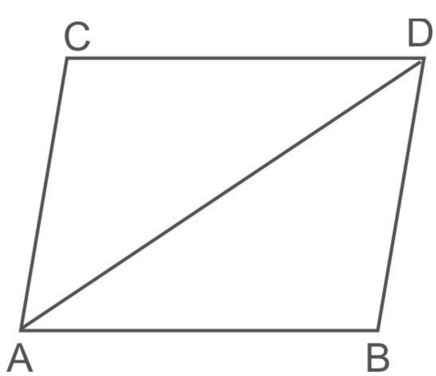
Key Concepts

* Area of a parallelogram = (base X height)
* Area of a triangle = ½ X base X height
* Area of a trapezium = $\frac{1}{2} \times (sum\ of\ parallel\ sides) \times distance\ between\ them$
* Area of rhombus = $\frac{1}{2} \times product\ of\ diagonals$
* Parallelogram on the same base and between the same parallels are equal in area.
* A parallelogram and a rectangle on the same base and between the same parallels are equal in area.
* Triangles on the same base and between the same parallels are equal in area.
* If a triangle and parallelogram are on the same base and between the same parallels, then.

  (Area of triangle) $= \frac{1}{2}(area\ of\ the\ parallelogram)$
* A diagonal of parallelogram divides it into two triangles of equal areas.

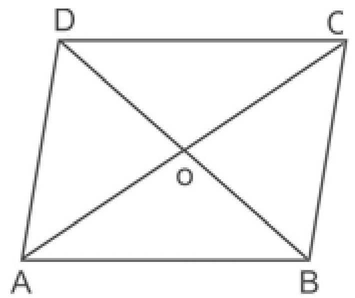
  In parallelogram ABCD, we have

  Area of $\Delta ABD = area\ of\ \Delta ACD$



* The diagonals of a parallelogram divide it into four triangles of equal areas therefore

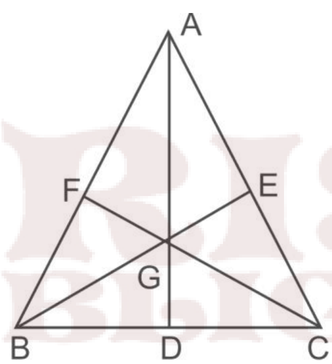
$ar(\Delta AOB) = ar\ (\Delta COD) = ar\ (\Delta AOD) = ar(\Delta BOC)$



* A median AD of a ΔABC divides it into two triangles of equal areas. Therefore $ar(\Delta ABD) = ar(\Delta ACD)$

* If the medians of a ΔABC intersect at G, then

$ar(\Delta AGB) = ar(\Delta AGC) = ar(\Delta BGC) = \frac{1}{3} ar(\Delta ABC)$



Section - A

Q.1 If E, F, G & H are mid points of sides of parallelogram ABCD, then show that $ar(EFGH) = \frac{1}{2}\ ar(ABCD)$

Q.2 Point P and Q are on the sides DC and AD of a parallelogram respectively. Show that. $ar(APB) = ar(BQC)$

Q.3 Show that a median of a triangle divides it into two triangle of equal area.

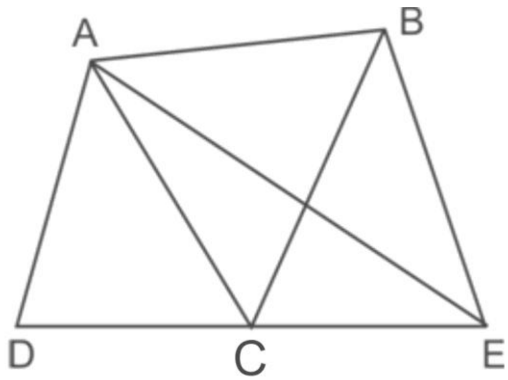
Q.4 PQRS and ABRS are two parallelograms and X being any point on side BR. Show that.

(i) $ar(PQRS) = ar(ABRS)$

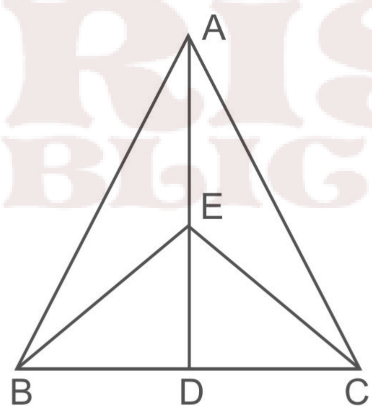
(ii) $ar(A \times S) = \frac{1}{2}\ ar(PQRS)$

Section - B

Q.5 In given figure ABCD is a quadrilateral and BE||AC is such that BE meets at E on the extended CD. Show that area of triangle ADE is equal to the area of quadrilateral ABCD.



Q.6 In given figure E be any point on the median AD of triangle, show that $ar(ABE) = ar\ (ACE)$



Q.7 Show that the diagonals of a parallelogram divides it into four triangles of equal area. OR

OR D, E & F are mid points of sides of triangle BC, CA & AB respectively. Show that

(i) BDEF is a parallelogram

(ii) $ar(DEF) = \frac{1}{4}\ ar(ABC)$

(iii) $ar\ (BDEF) = \frac{1}{2}\ ar(ABC)$

Section - C

Q.8 ABCD is a trapezium in which AB||CD and diagonals AC and BD intersect at 0. Prove that $ar(\Delta AOD) = ar(\Delta BOC)$

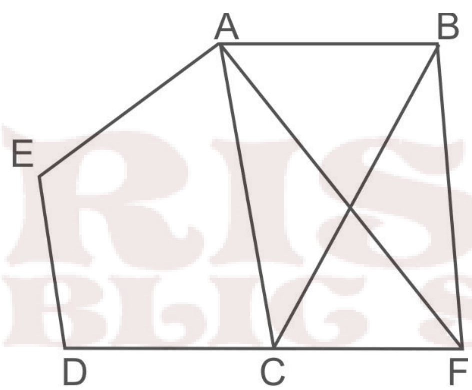
Q.9 XY is a line parallel to side BC of a triangle ABC. If BE||AC and CF||AB meet XY at E and F respectively.

$ar(ABE) = ar(ACF)$

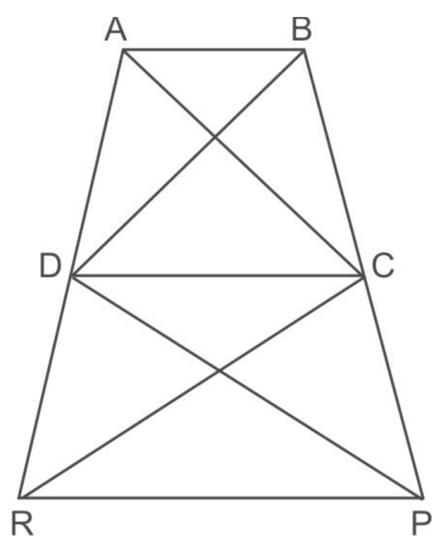
Q.10 In adjoining figure ABCDE is a pentagon. A line through B parallel to AC meets DC produced at F. Show that

(i) $ar(ACB) = ar(ACF)$

(ii) $ar(AEDF) = ar(ABCDE)$

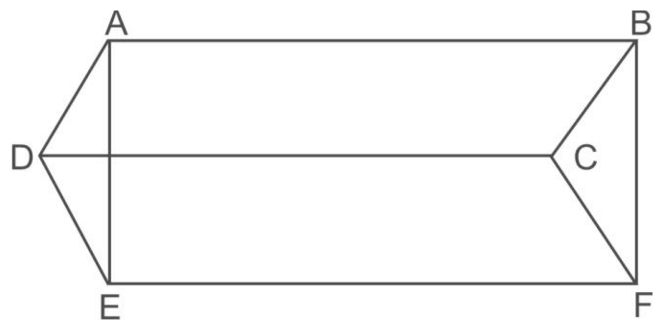


Q.11 In given figure $ar(DRC) = ar(DPC) and\ ar(BDP) = ar(ARC)$ show that both quadrilaterals ABCD and DCPR are trapeziums.



Self Evaluation

Q.12 In given figure ABCD, DCFE and ABFE are parallelogram show that ar (ADE) = ar (BCF)



Q.13 P and Q are respectively the mid points of sides AB and BC of a triangle ABC and R is the mid-point of AP, show that.

(i) $ar(PQR) = \frac{1}{2}\, ar(ARC)$

(ii) $ar(RQC) = \frac{3}{8}\, ar(ABC)$

(iii) $ar(PBQ) = ar(ARC)$

Q.14 Parallelogram ABCD and rectangle ABEF are on the same base and have equal areas. Show that perimeter of the parallelogram is greater than that of rectangle.

Chapter - 10

(Circle)

Key Concept

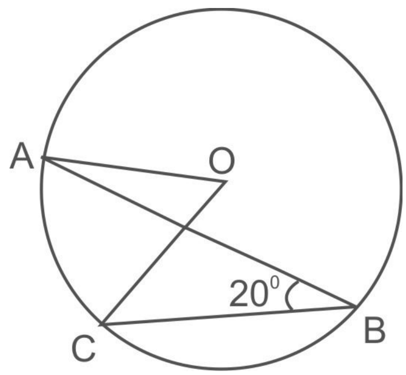
* Circle - circle is locus of such points which are at equidistant from a fixed point in a plane.
* Concentric circle - Circle having same centre called concentric circle.
* Two arc of a circle called congruent if they have the same degree measure.
* If two arc equal then their corresponding chords are equal.
* The perpendicular from centre to chord of circle, it bisects the chord and converse.
* There is one and only one circle passing through three non-collinear points.
* Equal chords of circle are equidistant from centre.
* The angle subtend by an arc at the centre of circle is twice the angle which subtend at remaining part of circumference.
* Any two angles in the same segment of the circle are equal.
* Angle of semicircle is right angle.
* Equal chords of circle subtend equals angle at the centre of circle.
* If the all vertices of a quadrilateral lie on the circumference of circle then quadrilateral called cyclic.
* In a cycle quadrilateral the sum of opposite angles is 180^0 and converse.
* The exterior angle of a cycle quadrilateral is equal to the opposite interior angle.

Section - A

Q.1 AD is diameter of a circle and AB is a chord If AD = 34cm, AB=30cm. The distance of AB from centre of circle is.

(a) 17cm (b) 15cm (c) 4 cm (d) 8cm

Q.2 In given figure, O is centre of circle if $\angle ABC = 20^0$ then $\angle AOC$ is equal to :

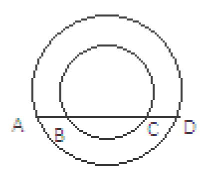


(a) 20^0 (b) 40^0 (c) 60^0 (d) 10^0

Q.3 Given three collinear points then the number of circles which can be drawn through these three points are.

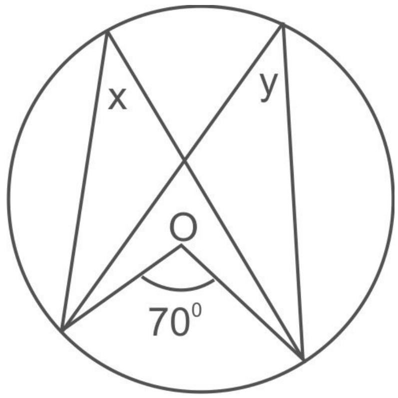
(a) one (b) two (c) infinite (d) none

Q.4 Given two concentric circles with centre O. A line cut the circle at A, B, C and D respectively if AB = 10cm then length of CD.



(a) 5cm (b) 10cm (c) 3.5cm (d) 7.5cm

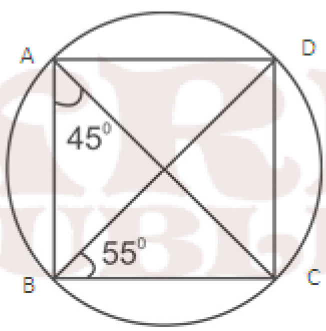
Q.5 In given figure value of y is



(a) 35^0 (b) 45^0

(c) 70^0 (d) 140^0

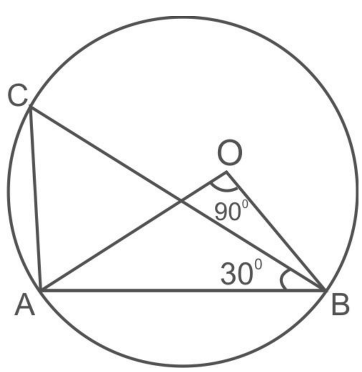
Q.6 In the given figure, $\angle DBC = 55^0,\ \angle BAC = 45^0\ \ then\ \angle BCD$ is



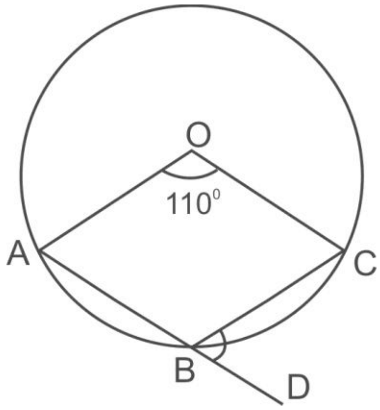
(a) 45^0 (b) 55^0 (c) 100^0 (d) 80^0

Section - B

Q.7 In the given figure, $\angle CAB$ is ………………….., given $\angle AOB = 90^0,\ \angle CBA = 30^0$



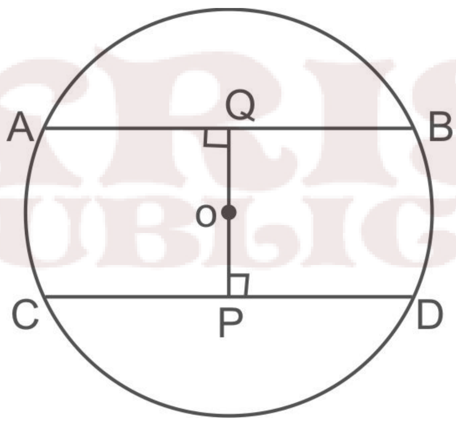
Q.8 If 0 is centre of circle as shown in the figure, $\angle CBD$.



Q.9 In the given figure, 0 is the center of the circle with radius 5cm. $OP \perp CD$,

$OQ \perp AB$

$AB||CD, AB = 6cm$ and CD = 8cm determine PQ.

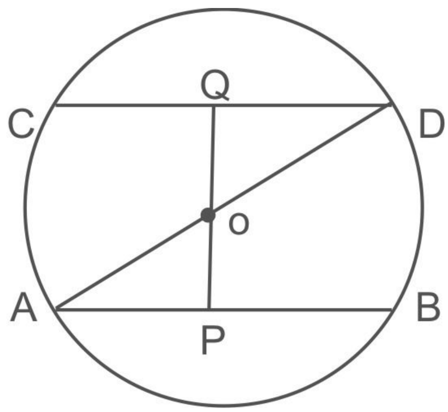


Q.10 Prove that the circle drawn on any equal side of an isosceles triangle as diameter, bisects the base.

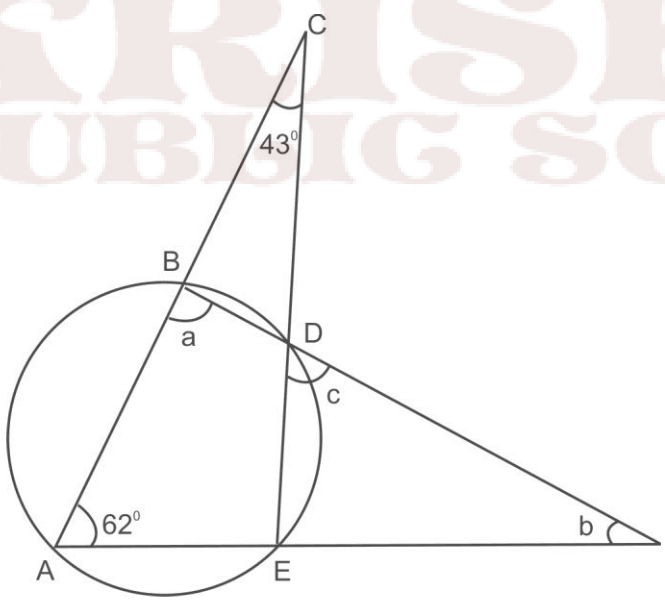
Q.11 Prove that cyclic parallelogram is always a rectangle.

Section - C

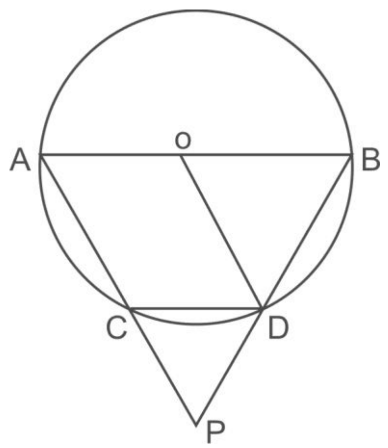
Q.12 In the given figure AD is diameter of the circle, whose centre is O and AB||CD, Prove that AB = CD



Q.13 In the given figure determine a, b and c.



Q.14 AB is a diameter of circle C (O, r). Chord CD is equal to radius OD. AC and BD produced interest at P. Prove that $\angle APB = 60^0$



Q.15 If two non parallel side of a trapezium are equal, prove that it is cyclic.

Q.16 ABC is a right angle triangle, right angled at A. A circle is inscribed in it. The length of two sides containing angle A is 12cm and 5cm find the radius.

Section - D

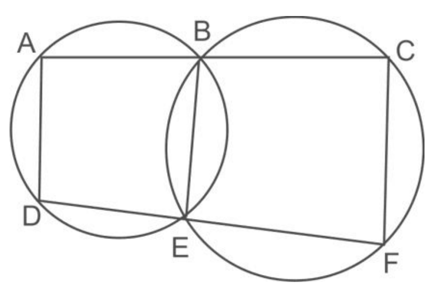
Q.17 A circle has radius $\sqrt{2}cm$. It is divided into two segments by a chord of length 2cm. Prove that the angle subtended by the chord at a point in major segment is 45^0.

Q.18 Two circles interest each other at points A and B. AP and AQ are diameters of the two circles respectively. If $\angle APB = 40^0$ and $\angle AQB = 70^0$, find $\angle PAB$ and $\angle QAB$

Q.19 ABCD is a parallelogram. The circle through A, B and C intersects CD produced at E. If AB=10cm, BC=8cm, CE=14cm. Find AE.

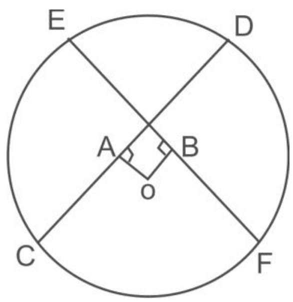
Q.20 Prove the sum of either pair of opposite angles of a cycle quadrilateral is 180^0.

Q.21 In the given figure, B and E are points on line segment AC and DF respectively show that AD||CF.

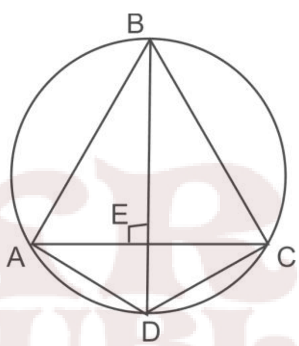


Self evaluation

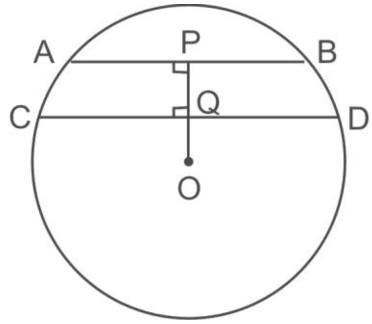
Q.22 In the given figure, OA and OB are respectively perpendiculars to chords CD and EF of a circle whose centre is O. If OA = OB, prove that $\widehat{EC} = \widehat{DF}$



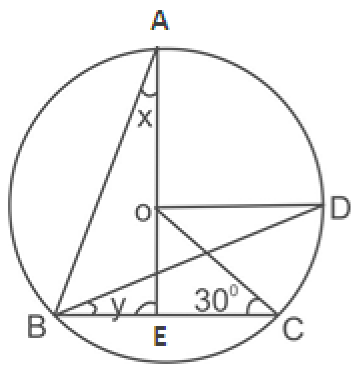
Q.23 In the given figure $\angle BAC = 55^0,\ \angle BCA = 62^0$, the altitude BE produced meets the circle at D, determine $\angle ACD,\ \angle DAC\ \ and\ \angle ADB$



Q.24 In the given figure, O is centre of circle of radius 5cm. $OP \perp CD, AB||CD,$ $AB = 6cm\ and\ CD = 8cm$. Determine PQ



Q.25 In the given figure. O is the centre of circle, $\angle BCO = 30^0 \angle AEB = 90^0$
and OD || BC find x and y.



Q.26 O is circumcentre of the triangle ABC and D is the mid-point of the base BC.

Prove that $\angle BOD = \angle A$

Answers:

1.	(d)	2.	(b) 40^0	3.	(d) None	4.	(b)
5.	(a) 35^0	6.	(d) 80^0	7.	105^0	8.	55^0
9.	7 cm.	13.	a=105,b=13,c=62	16.	2cm.		

18. 50^0, 20^0

19. 8cm.

23. 35^0, 28^0, 62^0

24. 1cm

25. 30^0, 15^0

Chapter - 11

(Constructions)

Key Concept

(1) Use only ruler and compass while drawing constructions.

(2) Protractor may be used for drawing non-standard angles.

(3) Constructions of a triangle given its base, a base angle and the difference of the other two sides.

(4) Constructions of a triangle given its perimeter and its two base angles.

Section - A

Q.1 With a ruler and compass which of the following angles cannot be constructed?

(a) 60^0 (b) 80^0 (c) 90^0 105^0

Q.2 With a ruler and compass which of the following angles can be constructed?

(a) 80^0 (b) 90^0 (c) 100^0 110^0

Section - B

Q.3 Construct an angle of 45^0 at the initial point of a given ray and justify the construction.

Q.4 Construct the following angles and verify by measuring them by a protractor.

(i) 75^0 (ii) 135^0

Section - C

Q.5 Construct a ΔPQR with base $QR = 3.8cm,\ \angle Q = 75^0$ and $PQ + PR = 7.9cm$

Q.6 Construct a ΔPQR with base $QR = 3.4cm, \angle R = 75^0 and\ PR - PQ = 1.2cm$

Q.7 Construct an equilateral triangle with sides 4cm.

Section -D

Q.8 Construct a triangle ABC in which $\angle B = 60^0$, $\angle C = \angle 45^0$ and AB+BC+CA = 13 cm.

Q.9 Construct a right triangle whose base is 12cm and sum of its hypotenuse and other side is 18cm.

Q.10 Construct a ΔPQR with its perimeter = 11cm and the base angles of 75^0 and 30^0.

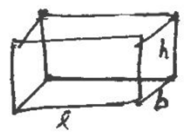
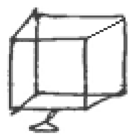
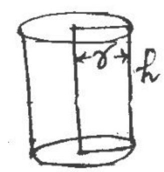
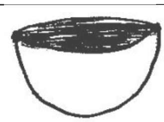
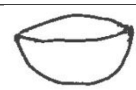
Answers:

Q.1 b Q.2 b

Chapter - 13

(Surface areas and Volumes)

Key Concepts

SN.	Name	Figure	Lateral/curved surface area	Total surface area T	Volume (V)	Symbols use for
1	Cuboid		$2(l+b)\times h$	$2(lb+bh+hl)$	lbh	$l = length$ b = breadth h = height
2.	Cube		$4s^2$	$6s^2$	s^3	s = side
3.	Right circular cylinder		$2\pi rh$	$2\pi r(h+r)$	$\pi r^2 h$	h = height r = radius of base
4.	Right circular cone	 $l^2 = r^2 + h^2$	πrl	$\pi r(l+r)$	$\frac{1}{3}\pi r^2 h$	r = radius of base h = height l = slant height
5.	Sphere		$4\pi r^2$	$4\pi r^2$	$\frac{4}{3}\pi r^3$	r = OA = radius
6.	Hemi sphere Solid		$2\pi r^2$	$3\pi r^2$	$\frac{2}{3}\pi r^3$	r = OA = radius
7.	Hemi sphere hollow		$2\pi r^2$	$2\pi r^2$	$\frac{2}{3}\pi r^3$	r = OA = radius

Section - A

Q.1 If surface areas of two spheres are in the ratio of 4: 9 then the ratio of their volumes is

(a) $\frac{16}{27}$ (b) $\frac{4}{27}$ (c) $\frac{8}{27}$ (d) $\frac{9}{27}$

Q.2 The surface area of a cube whose edge is 11cm is

(a) 725cm^2 (b) 726cm^2 (c) 727cm^2 (d) 728cm^2

Q.3 A match box measures 4cm X 2.5cm X 1.5cm. What will be the volume of a packet containing 12 such boxes?

(a) 15cm^3 (b) 180cm^3 (c) 90cm^3 (d) 175cm^3

Q.4 The curved surface area of a right circular cylinder of height 14cm is 88cm^2. Find the diameter of the base of the cylinder.

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

Q.5 The total surface area of a cone of radius $\frac{r}{2}$ and length $2l$ is

(a) $2\pi r(l + r)$ (b) $\pi r(l + r)$

(c) $\pi r\left(l + \frac{r}{4}\right)$ (d) $\pi r\left(l + \frac{r}{2}\right)$

Q.6 The surface area of sphere of radius 10.5cm is

(a) 1386cm^2 (b) 616cm^2

(c) 1390cm^2 (d) 10cm^2

Section - B

Q.7 Find the volume of a sphere whose surface area is 154cm^2.

Q.8 A solid cylinder has a total surface area of 231cm^2. Its curved surface area is $\frac{2}{3}$ of the total surface area. Find the volume of the cylinder.

Q.9 The diameter of a garden roller is 1.4m and it is 2m long. How much area will it cover in 5 revolutions? ($\pi = 22/7$)

Q.10 Three metal cubes whose edge measure 3cm, 4cm and 5cm respectively are melted to form a single cube, find its edge.

Q.11 The dimensions of a cubiod are in the ratio of 1 : 2 : 3 and its total surface area is $88m^2$. Find the dimensions.

Section - C

Q.12 A cuboidal oil tin is 30cm X 40cm X 50cm. Find the cost of the tin required for making 20 such tins if the cost of tin sheet is Rs. $20/m^2$.

Q.13 Find the lateral curved surface area of a cylindrical petrol storage tank that is 4.2m in diameter and 4.5m high. How much steel was actually used, if $\frac{1}{12}$ of steel actually used was wasted in making the closed tank.

Q.14 The radius and height of a cone are in the ratio 4 : 3. The area of the base is $154cm^2$. Find the area of the curved surface.

Q.15 A sphere, cylinder and cone are of the same radius and same height. Find the ratio of their curved surfaces.

Q.16 A hemispherical bowl of internal diameter 36cm contains a liquid. This liquid is to be filled in cylindrical bottles of radius 3cm and height 6cm. How many bottles are required to empty the bowl?

Q.17 A hemisphere of lead of radius 8cm is cast into a right circular cone of base radius 6cm. Determine the height of the cone.

Section - D

Q.18 A wooden toy is in the form of a cone surmounted on a hemisphere. The diameter of the base of the cone is 6cm and its height is 4cm. Find the cost of painting the toy at the rate of Rs. 5 per $1000cm^2$.

Q.19 Find the volume of the largest right circular cone that can be fitted in a cube whose edge is 14cm.

Q.20 A cone of height 24cm and slant height 25cm has a curved surface area $550cm^2$. Find its volume use $\pi = \frac{22}{7}$

Q.21 The radius and height of a cone are 6cm and 8cm respectively. Find the curved surface area of the cone.

Q.22 A well with 10m inside diameter is dug 14m deep. Earth taken out of it is spread all around to a width of 5m to form an embankment. Find the height of embankment.

Q.23 A metallic sheet is of the rectangular shape with dimensions 48cm X 36cm. From each one of its corners, a square of 8cm is cutoff. An open box is made of the remaining sheet. Find the volume of the box.

self evaluation

Q.24 Water in a canal, 30dm wide and 12dm deep is flowing with a velocity of 20km per hour. How much area will it irrigate in 30min. if 9cm of standing water is desired? (10dm = 1 meter)

Q.25 Three cubes of each side 4cm are joining end to end. Find the surface area of resulting cuboid.

Q.26 A hollow cylindrical pipe is 210cm long. Its outer and inner diameters are 10cm and 6cm respectively. Find the volume of the copper used in making the pipe.

Q.27 A semi circular sheet of metal of diameter 28cm is bent into an open conical cup. Find the depth and capacity of cup.

Q.28 If the radius of a sphere is doubled, what is the ratio of the volume of the first sphere to that of second sphere?

Answer

Q.1	c	Q.2	b	Q.3	b	Q.4	b
Q.5	c	Q.6	a				

Q.7 179.66cm^2

Q.8 269.5cm^2 Q.9 44m^2

Q.10 6cm Q.11 2, 4, 6 cm

Q.12 Rs. 376 Q.13 59.4m^2, 95.04m^2

Q.14 192.5cm^2

Q.15 $4 : 4 : \sqrt{5}$ Q.16 72

Q.17 28.44 Q.18 Rs. 0.51

Q.19 718.66cm^3 Q.20 1232 cm^2

Q.21 60πcm^2 Q.22 4.66m

Q.23 5120cm^3 Q.24 4,00,000m^2

Q.25 224 cm^2 Q.26 10560cm^3

Q.27 12.12cm, 622.26cm^3

Q.28 1:8

Chapter - 14

(Statistics)

Key Concept

* There are two types of data (i) Primary (ii) Secondary
* We can represent the data by (i) ungrouped and grouped frequency distribution.
* Data can also represent by (i) bar graph (ii) Histogram (iii) Frequency polygons
* Class mark of grouped data is $\frac{lower\ limit\ +\ upper\ limit}{2}$
* Measure of central tendencies by mean, median, mode.
* Mean $(\bar{x})\ =\ \frac{sum\ of\ all\ observations}{Total\ no. of\ observations}$

  If observations denoted by x_i and their occurrence i.e. frequency is denoted by f_i then mean is

$$(\bar{x}) = \frac{\Sigma f_i x_i}{\Sigma \mathrm{f_i}}$$

* Median: Arrange the observations in ascending or descending order then if numbers of observations (n) are odd then then median is $\frac{n+1}{2}th$ term.

  If no. of observations (n) are even then median is average of $\frac{n}{2}th$ and $\frac{n}{2}+1$ th terms.
* Mode: The observation whose frequency is greatest.
* Mode = 3 median - 2 mean.

Section - A

Q.1 If the mean of 2, 4, 6, 8, x, y is 5 then find the value of x+y.

Q.2 Write the class mark of 90-110 group.

Q.3 If the ratio of mean and median of a certain data is 2:3, then find the ratio of its mode and mean.

Q.4 Tally marks are used to find ………….

Q.5 The following marks were obtained by the students in a test.

81, 72, 90, 90, 86, 85, 92, 70, 71, 83, 89, 95, 85, 79, 62

What is the range?

Q.6 In a histogram, each class rectangle is constructed with base as

(a) frequency (b) class interval

(c) range (d) size of the class

Section - B

Q.7 The mean of 10 numbers is 20, If 5 is subtracted from every number, what will be the new mean.

Q.8 Find the mean of first 10 even natural no.

Q.9 Calculate the mean for the following distribution.

x	5	6	7	8	9
f	4	8	14	11	3

Q.10 Find the median of 37, 31, 42, 43, 46, 25, 39, 45, 32

Q.11 Find the mode of following series.

25, 23, 22, 22, 24, 27, 27, 25, 23, 22, 26, 32

Q.12 If the median of a series of data is 3 and mean is 2 then find the mode.

Section - C

Q.13 Find the median of the following data

19, 25, 59, 48, 35, 31, 30, 32, 51. If 25 is replaced by 52, what will be the new median.

Q.14 If the mean of the following distribution is 6, then find the value of p.

x	2	4	6	10	p+5
f	3	2	3	1	2

Q.15 If the mean of five observations x, x+2, x+4, x+6, x+8 is 11 find the mean of first three observation.

Q.16 The mean of 5 numbers is 18. If one number is excluded, their mean is 16, find the excluded number.

Q.17 Construct a histogram for the following data:

30-60	60-90	90-120	120-150	150-180
5	12	14	18	10

Q.18 The following observations have been arranged in ascending order. If the median of the data is 63, find the value of x.

29, 32, 48, 50, x, x+2, 72, 78, 84, 95

Section - D

Q.19 Find the value of x and y in following distribution if it known that the mean of the distribution is 1.46.

No. of accidents	0	1	2	3	4	5	Total
Frequency	46	x	y	25	10	5	200

Q.20 The mean monthly salary of 10 members of a group is Rs. 1445, one more member whose monthly salary is Rs. 1500 has joined the group. Find the mean monthly salary of 11 members of the group.

Q.21 Draw a histogram for the marks of students given below.

Marks	0-10	10-30	30-45	45-50	50-60
No. of Student	8	32	18	10	6

Q.22 For the following data, draw a histogram and frequency polygon.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of student	5	10	4	6	7	3	2	2	3	9

Q.23 Given below is a cumulative frequency distribution table showing the age of people living in a locality.

Age in years	**No. of persons**
Above 108	0
Above 96	1
Above 84	3
Above 72	5
Above 60	20
Above 48	158
Above 36	427
Above 24	809
Above 12	1026
Above 0	1124

Prepare a frequency distribution table.

Question for self evaluation

Q.24 The marks scored by 55 students in a test are given below :

Marks	0-5	5-10	10-15	15-20	20-25	25-30	30-35
No. of Students	2	6	13	17	11	4	2

Construct a histogram.

Q.25 Construct a frequency polygon for the following data :

Age	0-2	2-4	4-6	6-8	8-10	10-12	12-14	14-16	16-18
Frequency	2	4	6	8	9	6	5	3	1

Q.26 If $x, x_2 \ldots \ldots \ldots x_n$ are n values of a variable X such that

$\sum_{i=1}^{n} (x_1 - 2) = 110 \; and \; \sum_{i=1}^{n} (x_1 - 5) = 20$ find the value of n and mean.

Q.27 The mean of 200 items was 50. Later on, it was discovered that the two items were misread as 92 and 8 instead of 192 and 88. Find the correct mean.

Q.28 Find the value of p, if the mean of following distribution is 20.

x	15	17	19	20+p	23
frequency	2	3	4	5p	6

Answers :

Q.1	10	Q.2	100	Q.3	5:2	Q.4	Frequency	Q.5	33	Q.6	b
Q.7	15	Q.8	11	Q.9	7.025	Q.10	39	Q.11	22	Q.12	5
Q.13	32,35	Q.14	7	Q.15	9	Q.16	26	Q.18	62	Q.19	x=76, y=38

Q.20 Rs 1450 Q.23

Age	0-12	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108
Person	98	217	382	269	138	15	2	2	1

Q.26 n=30, mean = $\frac{17}{3}$

Q.27 50.9 Q.28 1

Chapter - 15

(Probability)

Key Concept

(1) Experiment - A job which produces some outcomes.

(2) Trial - Performing an experiment.

(3) Event - The group of outcomes, denoted by capital letter of English alphabets like A, B, E etc.

(4) The empirical (or experimental) probability P(E) of an event E is given by

$$P(E) = \frac{Number\ of\ trials\ in\ which\ E\ has\ happend}{Total\ no.of\ trials}$$

(5) The probability of an event lies between 0 and 1 (0 and 1 are included)

(6) Impossible event: Event which never happen.

(7) Certain event - event which definitely happen.

Section - A

Q.1 Define an event.

Q.2 Give definition of probability.

Q.3 Probability of certain event is …………

Q.4 Probability of impossible event is ………..

Q.5 Which is not a probability of an event?

(a) 2 (b) $\frac{2}{3}$ (c) .001 (d) .25

Q.6 A bag contains 50 coins and each coin marked from 51 to 100. One coin is picked up at random. The probability that the number on the coin is not a prime number is……………………

Section - B

Q.7 A coin is tossed 1000 times with the following frequencies.

Head: 455, Tail: 545

compute the probability for each event.

Q.8 In a cricket match, a batsman hits a boundary 6 times out of 30 balls plays. Find the probability that on a ball played.

(i) He hits boundary (ii) He does not ht a boundary.

Q.9 Three coins tossed simultaneously 100 times with the following frequencies of different outcomes.

Out come	No head	one head	two head	three head
Frequency	14	38	36	12

If the coin tossed again then find the probability.

(i) two heads coming up

(ii) 3 heads coming up

(iii) getting more tails than heads

(iv) at least one head coming up

Q.10 In a football match, a player makes 4 goals from 10 kicks. The probability of a goal is from 10 kicks is.

Section - C

Q.11 The percentage of marks obtained by a student in the monthly unit tests are given as :

Unit Test	I	II	III	IV	V
% marks obtained	58	64	76	62	85

Find the probability that the student get a distinction (marks more than 75%)

Q.12 1000 families with 2 children were selected randomly, and the following data were recorded.

No. of boys in a family	0	1	2
No. of families	140	560	300

If a family chosen at random, find the prob. that it has

(a) No boys

(b) One boy

(c) Two boys

(d) at least one boy

(e) at most two boy.

Q.13 The record of a weather station shows that out of the past 250 consecutive days, its weather forecast correct 175 times. What is the probability that on a given day.

(i) it was correct.

(ii) it was not correct.

Section - D

Q.14 A die is thrown 1000 times with following frequency of out comes 1, 2, 3, 4, 5 and 6 as given below

No. on die	1	2	3	4	5	6
Frequency	179	150	157	149	175	190

Find the probability of each out come.

Q.15 Following table shows the marks scored by a group of 90 students in a mathematics test of 100 marks.

Marks	0-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of student	7	10	10	20	20	15	8

Find the probability that a student obtained

(i) less than 20% marks (ii) 60 or more marks

Q.16 The following table gives the life of 400 lamps.

Life time in Hours	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
No. of Lamp	14	56	60	86	74	62	48

A bulb is selected at random find the probability that the life time of the selected bulb is:

(i) less than 400

(ii) between 300 to 800 hours.

(iii) at least 700 hours.

Q.17 The percentage of attendance of different classes in a year in a school is given below:

Class	X	IX	VIII	VII	VI	V
Attendance	30	62	85	92	76	55

What is the probability that the class attendance is more than 75%

Answers:

Q.5 a 6. 4/5 7. 0.455, 0.545

8. (i) 0.2 (ii) 0.8

9. (i) 0.36 (ii) 0.12 (iii) 0.52 (iv) 0.86

10. $\frac{4}{10}$

11. 0.4

12. (a) 0.14 (b) 0.56 (c) 0.30 (d) 0.86 (e) 0.7

13. (i) 0.7 (ii) 0.3

14. (i) .179 (ii) .15 (iii) .157 (iv) .149 (v) .175 (vi) .19

15. 7/90 23/90

16. (i) $\frac{7}{200}$ (ii) $\frac{29}{40}$ (iii) $\frac{23}{50}$

17. ½

Activities / Projects (Term II)

(1) Verify that the sum of the angles of a quadrilateral is 360^0.

(2) Verify that the straight line joining mid-point of any two side of a triangle is parallel to the third side and is equal to half of it.

(3) Formulate the formula for the area of trapezium experimentally.

(4) Verify that the area of parallelogram on the same base and between same parallels are equal.

(5) Verify that the area of a triangle on the same base and between same parallels are equal.

(6) Verify that if the triangle and parallelogram are on same base and between same parallel lines, then area of triangle is equal to half of area of the parallelogram.

(7) Verify that the opposite angles of a cyclic quadrilateral are supplementary.

(8) Formulate the formula for the surface area of right circular cylinder.

(9) Formulate the formula for the volume of a cone and that of a hemi sphere / sphere from the formula of volume of a cylinder.

(10) Draw a histogram for FA-1 marks of students in your class.

(11) Find experimental probability of each outcomes of a die when it is thrown 15 times.

Term - II

Blue Print for SA-2

No.	Unit / Topic	Mark				
		1	2	3	4	Total
1	Algebra(contd.) linear eq^n in two variable	2(2)	-	6(2)	8(2)	16(6)
2	Geometry/quadrilateral Area of parallelogram and triangle, circles, construction.	2(2)	4(2)	12(4)	20(5)	38(13)
3	Mensuration (contd.) surface area and volume	2(2)	2(1)	6(2)	8(2)	18(7)
4	Statistics and probability	2(2)	6(3)	6(2)	4(1)	18(8)
	Total	8(8)	12(6)	30(10)	40(10)	90(34)

Sample Question Paper

Term - II

Time : 3hrs. **MM : 90**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper consists of 34 questions divided into 4 sections. A, B, C and D. Section - A comprises of 8 questions of 1 mark each. Section - B comprises of 6 questions of 2 marks each. Section - C comprises of 10 questions of 3 marks each and Section - D comprises of 10 questions of 4 marks each.

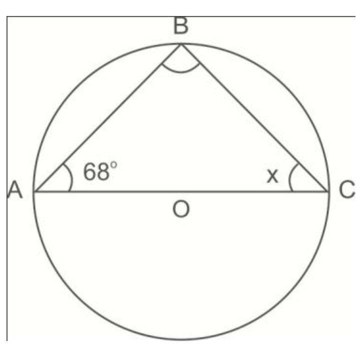
(iii) Question numbers 1 to 8 in section-A are multiple choice questions where you are to select one correct option out of the given four.

(iv) There is no overall choice. However, internal choice has been provided in 1 question of two marks. 3 questions of three marks each and 2 questions of four marks each. You have to attempt only of the alternatives in all such questions.

(v) Use of calculator is not permitted.

Section - A

Q.1 The value of x in the given figure is



(a) 22^0 (b) 33^0 (c) 44^0 (d) 68^0

Q.2 Three angle of a quadrilateral is 60^0, 110^0 and 86^0. The fourth angle of quadrilateral is

(a) 104^0 (b) 124^0 (c) 94^0 (d) 84^0

Q.3 Class mark of class interval 90-110 is

(a) 90 (b) 110 (c) 100 (d) None

Q.4 A die is thrown once. The probability of getting an even no. is

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$ (c) $\frac{1}{5}$ (d) 2

Q.5 Which one is solution of eq^n $x - 3y = 2$

(a) (4,1) (b) (6,2) (c) (5,1) (d) (0,2)

Q.6 If the lateral surface area of cube is $1600cm^2$ then its edge is

(a) 15cm (b) 18cm (c) 25cm (d) 20cm

Q.7 If the slant height of a cone is 10 cm and its radius is 6cm, then height of cone is

(a) 9cm (b) 13cm (c) 16cm (d) 8cm

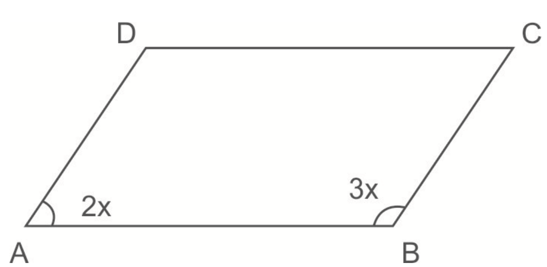
Q.8 If (2,-3) is solution of eq^n $3x - ky = 2$ then the value of K is

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

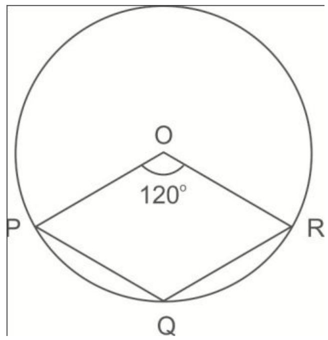
Section - B

Q.9 If the total surface area of a hemisphere is $27\pi\ cm^2$, then its diameter is equal to …………………..

Q.10 In the given parallelogram the value of x will be



Q.11 In the given figure, if $\angle POR$ is 120^0, then the value of $\angle PQR$ is …………….



Q.12 The arithmetic mean of first five odd natural no. is ………………

Q.13 The probability of an event lies between…………….., …………………

Q.14 Write the relation between mean, median and mode……..

Section - C

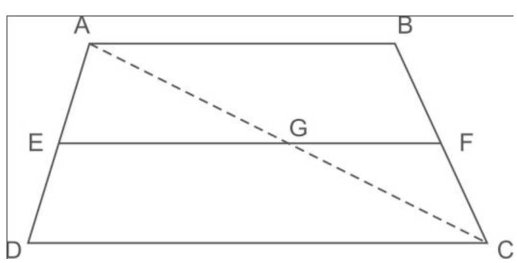
Q.15 Draw the graph of $2x + y = 6$ and find the point on x-axis where graph of this eq^n cut the x-axis.

Q.16 Find three solution of the linear equation $2x + 3y = 5$, and check whether (-3, 4) is a solution of the given equation.

Q.17 In a parallelogram, show that the angle bisectors of two adjacent angles intersect at right angle.

OR

In the given figure, E is the mid-point of side AD of a trapezium ABCD with AB||CD. A line through E parallel to AB meets BC in F show that F is the mid-point of BC.

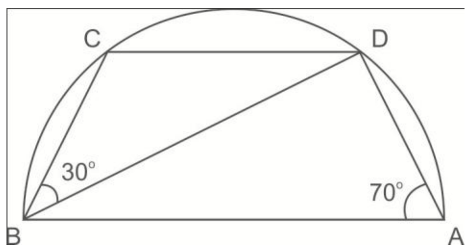


Q.18 Triangle ABC and DBC are on the same base BC with vertices A and D on opposite sides of BC such that area of $\Delta ABC = area\, of\ \Delta DBC$. Show that BC bisect AD.

Q.19 ABCD is a cyclic quadrilateral BA and CD produced meet at E. Prove that triangle EBC and EDA are equiangular.

OR

In given figure, C and D are points on the



Semi circle described on BA as diameter given $\angle BAD = 70^0$, $\angle DBC = 30^0$ Calculate $\angle ABD\ and\ \angle BDC$.

Q.20 Construct a triangle ABC in which BC=4.5cm $\angle B = 45^0\ and\ AB - AC = 2.5cm$

Q.21 A conical tent is 10m high and the radius of its base is 24m. Calculate its slant height and cost of canvas required to make it at the rate Rs. 70 per m^2.

Q.22 A sphere, a cylinder and a cone are the same radius and same height. Find the ratio of their curved surfaces.

OR

Volume of a cube is 5832m^3. Find the cost of painting its total surface area at the rate of Rs. 3.50 per m^2.

Q.23 A car is going for a long journey of 16 hours starting at 5.00 hours. The speed of the car at different hours is given below.

Time (in hours)	Speed (in km/hr.)
5.00	40
7.00	50

9.00	60
11.00	80
13.00	70
15.00	65
17.00	75
19.00	60
21.00	50

Draw a velocity time graph for the above data.

Q.24 A coin is tossed 15 times and observed that 11 times head comes up. Find the probability that a tail comes up.

Section - D

Q.25 The taxi fare in a city is as follow. For the first kilometer, the fare is Rs. 8 for the subsequent distance it is Rs. 5 per km. Taking the distance covered as x km. and total fare as Rs. y, write a linear equations for this information and draw its graph.

Q.26 If the points A (3,5) and B(1,4) lies on the line $ax + by = 7$ find the values of a and b.

OR

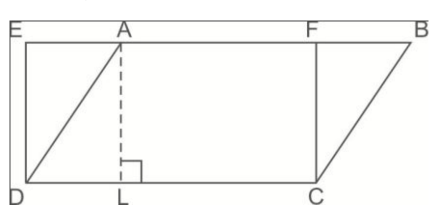
Draw the graph of the equation $-y = 1 \; and \; 2x + y = 8$. Shade the area bounded by these two lines and y-axis. Also determine this area.

Q.27 ABCD is a parallelogram. AB produced to E so that BE=AB. Prove that ED bisects BC.

Q.28 In given figure, ABCD is a parallelogram and EFCD is a rectangle. Also $AL \perp DC$ Prove that

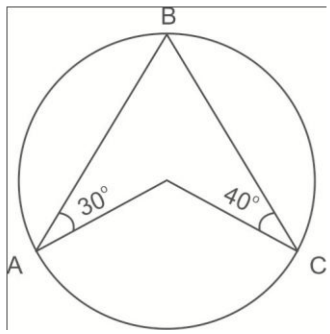
(i) $ar(ABCD) = ar(EFCD)$

(ii) $ar(ABCD) = DCXAL$



Q.29 Prove that the area of an equilateral triangle is equal to $\frac{\sqrt{3}}{4}a^2$ where a is the side of the triangle.

Q.30 In given figure, calculate the angle $\angle AOC$



Q.31 Construct a ΔABC in which BC=5.6cm, AC-AB=1.6cm and $\angle B = 45^0$

Q.32 The mean of the following distribution is 50.

x	frequency
10	17
30	5a+3
50	32
70	7a-11
90	19

Find the value of a and frequency of 30 and 70.

Q.33 How many planks each of which is 2m long, 2.5 cm broad and 4cm thick can be cut off from a wooden block 6m long, 15cm broad and 40cm thick?

Q.34 An iron pipe 20cm long has exterior diameter equal to 25cm. If the thickness of the pipe is 1 cm. Find the whole surface area of the pipe excluding ends of the pipe.

OR

The diameter of a sphere is decreased by 25% by what percent its curved surface area decreases.

Sample Paper -II

Marking Scheme

Section - A

Q.1 (a)

Q.2 (a)

Q.3 (c)

Q.4 (a)

Q.5 (c)

Q.6 (d)

Q.7 (d)

Q.8 (d)

Section - B

Q.9 6cm

Q.10 36cm

Q.11 120^0

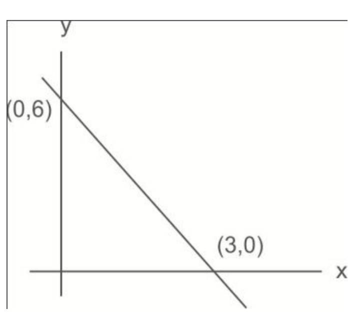
Q.12 5

Q.13 0 and 1, both no. are including.

Q.14 mode = 3 median - 2 mean

Section - C

Q.15



Point on x-axis is (3,0)

Q.16 $2x + 3y = 5$ ---------(1)

Put $x = 1, 2, 3, 0, -1, 2$ etc and get value of y.

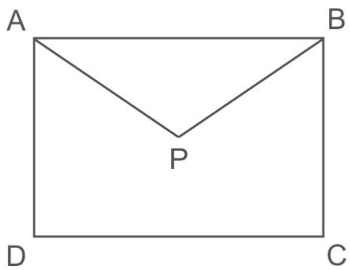
then $(x, y)\ is\ sol^n\ of\ this\ e\ \ ^n$

Put $x = -3$ and y = 4 in eq^n (1) we get

$$-\ 6 + 12 \neq 4$$

So (-3, 4) is not a solution.

Q.17



To prove $\angle APB = 90^0$

$\angle A + \angle B = 180^0$

$\frac{1}{2}\angle A + \frac{1}{2}\angle B = 90^0$

But $\frac{1}{2}\angle A + \frac{1}{2}\angle B + \angle APB = 180^0$

$90^0 + \angle APB = 180^0$

$\Longrightarrow\ \angle APB = 90^0$

OR

Construction : Join AC to intersect EF at G.

Proof EF||DE

EG || DE

since E is mid point of AD.

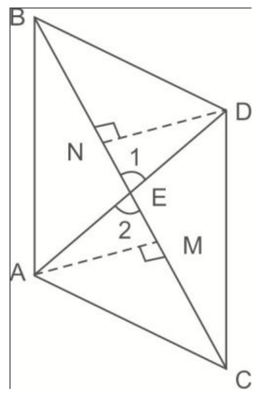
∴ G is mid point of AC (By converse of mid point theorem)

In $\Delta ABC\ FG||AB$.

G is mid point of AC

∴ F is mid point of BC.

Q.18



Construction : Join AD. Which intersect BC at E draw $DN \perp BC \quad AM \perp BC$

Proof :

AM=DN (Δ $on\ same$ base and equal in area so altitude is same)

Now in $\Delta AEM\ and\ DEN$

$\angle 1 = \angle 2$

$\angle AME = \angle DNE = 90^0$

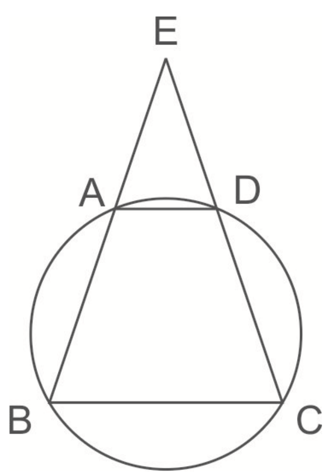
AM = DN

Δ AEM $\cong$ Δ DEN

So AE = DE

$\Rightarrow$ BC bisect AD

Q.19



Given ABCD is a cyclic quadrilateral BA and CD produced meet at E.

To prove ΔEBC and ΔEDA are equiangular.

Proof : ABCD is a cyclic quad.

$\therefore \ \angle BAD + \angle BCD = 180^0$

But $\angle BAD + \ \angle EAD = 180^0$ (linear pair)

$\Rightarrow \quad \angle BCD = \angle EAD$

Similarly $\angle ABC = \angle EDA$

and $\angle BEC = \angle AED$

Hence Δs EBC and EDA are equiangular

OR

$\angle BCD + \angle BAD = 180^0$ $(as\ ABCD\ is\ a\ cyclic\ quadrilateral)$

$\angle BCD + 70^0 = 180^0$

$\angle BCD = 110^0$ ------(1)

Also $\angle CBD + \angle BCD + \angle BDC = 180^0$

$30^0 + \ 110^0 + \angle BDG = 180^0$

$\angle BDC = 40^0$ Ans.

Since $\angle ADB$ is angle in semi-circle

$\angle ADB = 90^0$

In ΔABD

$\angle ABD + \angle ADB + BAD = 180^0$

$\angle ABD + 90^0 + 70^0 = 180^0$

$\angle ABD = 20^0$ Ans

Q.20 Steps of construction

(i) Draw a ray BX and cut off a line segment BC=4.5cm from it

(ii) Construct $\angle XBY = 45^0$

(iii) Cut off a line segment BD=2.5cm from BY

(iv) Join CD.

(v) Draw ⊥ bisector of CD cutting BY at a point A.

(vi) Join AC

So ΔABC is the required triangle.

Q.21 $l^2 = r^2 + h^2$

$l = 26m$

Curved surface area $= \pi r l$

Cost = 70 X $\pi r l$

= Rs. 137280

Q.22 Let r is radius then height of cone = sphere = cylinder = $2r$

So S_1 = curved surface of sphere $= 4\pi r^2$

S_2 = curved surface of cylinder = $4\pi r^2$

S_3 = curved surface cone = $\sqrt{5}\,\pi r^2$

as $l = \sqrt{r^2 + h^2} = \sqrt{r^2 + 4r^2} = \sqrt{5}\,r$ ratio : 4 : 4 : $\sqrt{5}$

OR

volume $S^3 = 5832m^3$

S = 18m

Painted area $6s^2$

$= 1944m^2$

Cost = 1944 X 3.5

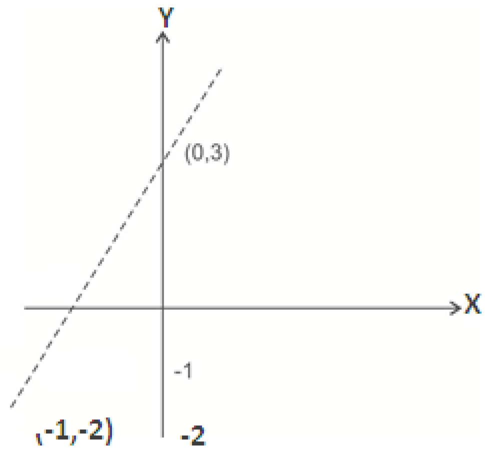
= Rs. 6804

Q.23 Check your graph with the help of your teacher/classmates

Q.24 Ans. $\frac{4}{15}$

Q.25 $y = 8 + 5 \times (x - 1)$

$\Longrightarrow y = 5x + 3$

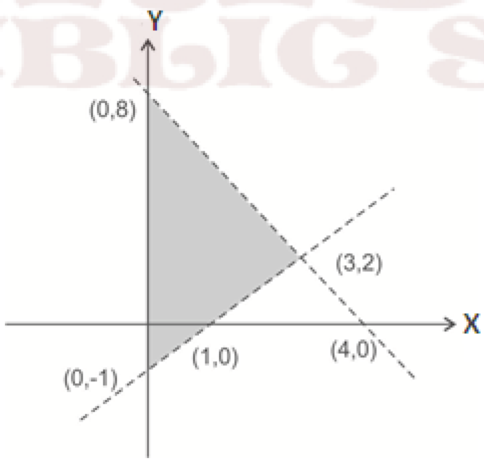


Q.26 $3a + 5b = 7$

$a + 4b = 7$

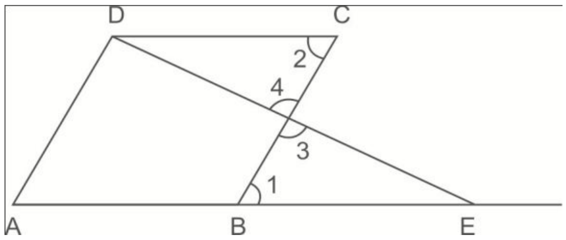
$a = -1,\ b = 2$

OR



Area = $\frac{1}{2} \times 9 \times 3 = 13.5\ sq\ units$.

Q.27



$AB||CD \ and \ BC$ transversal

So $\angle 1 = \angle 2$

$\angle 3 = \angle 4$

AB = CD = BE

So $\Delta BOE \cong \Delta COD$

$\Longrightarrow$ $BO = CO,$ O is mid of BC

$\Rightarrow$ ED bisect BC

Q.28 Since parallelogram and rectangle are on same base DC and between same height AL

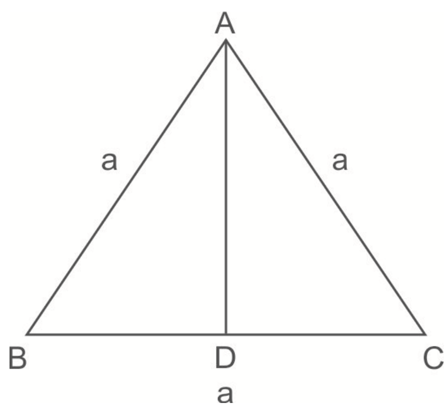
ar (ABCD) = ar(DEFE)

So ar (ABCD) = CD X FC

= CD X AL (AL = FC as ALCF is rectangle)

= DC X AL

Q.29



$\Delta ABD \cong \Delta ACD$

BD = DC = $\frac{a}{2}$

In $\Delta\ ADB$

$$AD^2 = a^2 = \frac{a^2}{4}$$

$$AD = \frac{\sqrt{3}}{4}\ a$$

$$ar\ \Delta ABC = \frac{1}{2} BC \times AD = \frac{\sqrt{3}}{4} a^2$$

Q.30 Join OB

the find $\angle ABO = 30^0$

and $\angle CBO = 40^0$

So $\angle ABC = 70^0$

So $\angle AOC = 140^0$

Q.31 Steps of const.

(i) Draw BC=5.6cm

(ii) At B make $\angle CBX = 45^0$

(iii) Produce XB to X^1 to form line XBX^1

(iv) From ray BX^1 cut off line segment BD = 1.6cm

(v) Join CD

(vi) Draw ⊥ bisector of CD which cut BX at A.

(vii) Join AC to obtain required ΔBAC

Q.32 $\Sigma fi = 12a + 60,\ \Sigma fixi = 640a + 2800$

$\bar{x} = \frac{\Sigma fixi}{\Sigma fi}$

$50 = \frac{640a + 2800}{12a+60}$

a = 5 Ans.

Q.33 number of planks = $\frac{volume\ of\ wooden\ block}{volume\ of\ each\ plank} = \frac{600 \times 15 \times 40}{200 \times 2.5 \times 4} = 180$

Q.34 R = 12.5 (External radius)

r = internal radius = (external radius - 1cm) = 11.5cm

h = 20cm

Total surface area = External surface area + Internal surface area = 3168cm^2

OR

Given S = $4\pi r^2$

Decreased radius = $\frac{3r}{4}$

then new area = $\frac{9\pi r^2}{4}$

Decreased area = $\frac{7\pi r^2}{4}$

% decrease = 43.75

Part III

Term - I

(1) Number system

QUIZ

Q.1 What is a rational number?

Q.2 What is an irrational number?

Q.3 What type of decimal representation do rational numbers have?

Q.4 Why do we calculate the approximate value of an irrational number?

Q.5 State whether $\sqrt{4}$ is an irrational or a rational number?

ORAL

Q.1 All rational and irrational number are ______________?

Q.2 Is 3.1010010001………………a rational number?

Q.3 Is $-2+\sqrt{5}$ negative or positive?

Q.4 The smallest composite number is …………..?

Q.5 The decimal expansion of $\sqrt{7}$ is non-terminating non recurring or non-terminating recurring.

(2) POLYNOMIALS

QUIZ

Q.1 What is the degree of a quadratic polynomial?

Q.2 How can you decide that $x - a$ is a factor of a polynomial $f(x)$?

Q.3 How many variables can be there in a polynomial?

Q.4 What is a linear polynomial?

Q.5 A cubic polynomial has how many zeroes?

ORAL

Q.1 A polynomial / expression with two terms is called ……………..?

Q.2 An example of a monomial of degree 7 is.

Q.3 If a + b + c = 0, then what is the value of $a^3 + b^3 + c^3$ is equal to ______?

Q.4 Complete this identity = $(a + b)^3 = \cdots$ … … … … … … …

Q.5 The zeroes of polynomial $P(x) = x(x + 2)(x - 3)$ are ………………?

(3) COORDINATE GEOMETRY

QUIZ

Q.1 In which quadrant does the point (-4,-5) lie?

Q.2 What are the coordinates of origin?

Q.3 What is the abscis of all the point on the y-axis?

Q.4 What is the ordinate of all point on the x-axis?

Q.5 Point (2,0) lies on which axis.

ORAL

Q.1 The perpendicular distance of the point (5,3) from the x-axis is …………..

Q.2 Point (-4,3) lies in the ……………..quadrant.

Q.3 The points in which abscis and ordinate have same signs will lie in ………..

Q.4 Is the point (5,-2) is same as the point (-2,5) or not.

Q.5 The ordinate of the point (1,9) is ………………..

(4) INTRODUCTION TO EUCLID'S GEOMETRY

QUIZ

Q.1 Name the part of a line which has only one end point.

Q.2 What was the name of the famous book of Euclid?

Q.3 How many lines can pass through a given point?

Q.4 How many common points can two distinct lines have?

Q.5 How many dimensions, a point has?

ORAL

Q.1 The side faced of a pyramid are ………………..

Q.2 Part of the line with two end points is called …………………

Q.3 To which country does Euclid belong?

Q.4 Axioms are assumed to be ……………….

Q.5 The things which are double of the same thing are ………………..

(5) LINES AND ANGLES

QUIZ

Q.1 What is the sum of the angles of triangle.

Q.2 What is the sum of two opposite angles of cyclic quadrilateral?

Q.3 Define Reflex angle.

Q.4 What is the complement of 45^0?

Q.5 What is the difference between a line and line segment?

ORAL

Q.1 40^0 and 50^0 are example of compliment angles or not?

Q.2 In a triangle with a right angle, the other two angles are …………….

Q.3 A line with two end points is called …………………….

Q.4 Through a point infinite number of …………….. can be drawn.

Q.5 An angle of measure greater than 90^0 but less than 180^0 is called …………

(6) TRIANGLES

QUIZ

Q.1 In right angled triangle which side is the longest side?

Q.2 What do you mean by congruence of two figures?

Q.3 What are the various parts of a triangle?

Q.4 Classify triangles on the basis of their sides?

Q.5 Classify triangles on the basis of their angles.

ORAL

Q.1 Angle opposite to greater side of a triangle is ………………..

Q.2 The sum of any two sides of a triangle is greater than ………………

Q.3 Each angle of an ………………….triangle is 60^0.

Q.4 If all angles of a triangle are equal, then all of its …………… are also equal.

Q.5 Can a triangle have two right angles?

(7) HERON'S FORMULAE

QUIZ

Q.1 What is semi perimeter of a triangle?

Q.2 What does the letter 's' used in Heron's formula denotes?

Q.3 Who gave the famous formula for calculating the area of a triangle in terms of its three sides?

Q.4 Triangle with no two side equal is called?

Q.5 What is the area of an equilateral triangle with side x units?

ORAL

Q.1 The area of a rhombus can be obtained by the measure of its two ………

Q.2 What is the formula to find area of a triangle?

Q.3 In a triangle, side opposite to the ………………. angle is longer.

Q.4 the sum of any two sides of a triangle is greater than …………………

Q.5 Name all the criterions for congruency of triangles.

Term - II

ORAL AND QUIZ QUESTIONS

Linear equations in two variables

Oral

Q.1 What is the equation of y-axis?

Q.2 What is the equation parallel t x-axis?

Q.3 What is the equation parallel to x-axis?

Q.4 What is the equation parallel to y-axis?

Q.5 Write the equation parallel to x-axis intersecting y-axis at 5 unit in +ive direction.

Q.6 How many solutions y=3x+5 has?

QUIZ

Q.1 If (4,9) is a solution of the equation y=kx then value of k……….

Q.2 If ax = b then value of x is

Q.3 If $ax + by + c = 0$ then coefficient of x is.

Q.4 What is linear equation in two variables?

QUADRILATERAL

ORAL

Q.1 In a quadrilateral the sum of all angles is ……….

Q.2 If angles of a quadrilateral are in ratio 1 : 2 : 3 : 4 then angles are …………..

Q.3 Consecutive angles of II gram are ………………

Q.4 If consecutive sides of II gram are equal then ||gram is ……………

QUIZ

Q.1 What is SSS criterion for $\Delta's$

Q.2 What is RHS criterion for $\Delta's$

Q.3 What is SAS criterion for $\Delta's$

Q.4 What is Pythagoras theorem?

Q.5 What is mid point theorem.

AREA OF II GRAMS AND TRIANGLES.

ORAL

Q.1 If ΔABC and BDE are equilaterals such that D is mid point of BC, then find $ar(\Delta ABC)\ :\ ar(\Delta BDE)$

Q.2 A triangle and II gram are on same base and between IIs then ratio of their areas.

Q.3 The median of a Δ divide it into …………….. parts.

Q.4 Sum of angle of a Δ is

QUIZ

Q.1 Area of II gram is …………………

Q.2 Area of Δ is …………………

Q.3 Area of right Δ is ……………………

Q.4 A diagonal of IIgram divide it into two equal in area and ……………… triangles.

Q.5 In a IIgram opposite angles are ………………..

CIRCLES

ORAL

Q.1 Give definition of circle.

Q.2 What is concentric circle?

Q.3 Twice the radius of circle called……………….

Q.4 Equal chord of circle subtend …………….angle.

Q.5 ⊥ bisector of chord divide it into ……………. parts.

QUIZ

Q.1 How many circle passes through one point.

Q.2 How many circles pass through three non collinear points?

Q.3 Tangent to a circle cut it into exactly in …………….. point / points

Q.4 What is cyclic quadrilateral?

Q.5 If the sum of any pair of opposite angles of a quadrilateral is 180^0, then quadrilateral is ……………….

SURFACE AREA AND VOLUME.

ORAL

Q.1 What is surface area.

Q.2 What is volume?

Q.3 Surface area of cuboid is ……………

Q.4 Surface area of cube is ……………….

Q.5 Surface area of hemi sphere ……………..

QUIZ

Q.1 What is the volume of cube whose side is 2cm?

Q.2 In a sphere number of faces is.

Q.3 Total surface area of hemi sphere whose radius is r is…………

Q.4 Volume of a hemisphere of radius r is ……………

Q.5 Define sphere.

STATISTICS

ORAL

Q.1 Find the mean of all factor of 10.

Q.2 Define primary and secondary data.

Q.3 The measures of central tendency are ……………

Q.4 What is class mark?

Q.5 What are tally marks?

QUIZ

Q.1 What is formula to find a mean?

Q.2 What is motto to read statistics?

Q.3 What is the relation between mean, mode, median.

Q.4 How many ways data can represent.

Q.5 Find the mean of first n natural numbers.

PROBABILITY

ORAL

Q.1 Who is the main founder of probability?

Q.2 What is experiment?

Q.3 How many types of event generally define?

Q.4 Is probability means %.

Q.5 What is the probability of certain event?

QUIZ

Q.1 Define event.

Q.2 The probability of an event lies between 0 and 1 are inclusive or exclusive.

Q.3 What is trial?

Q.4 What is out comes.

Q.5 How many out comes possible in tosses of a coin twice.

Coordinator of review committee

Sh. D. R. Meena

Principal, KV No. 1, Bajaj Nagar, Jaipur

Reviewed by

1. Mr. G. S. Yadav (PGT – Math)
2. Mr. O. P. Jat (TGT – Math)
3. Mr. O. P. Punia (TGT – Math)
4. Mr. R. Paliwal (TGT – Math)
5. Mr. R.P.S. Rathore (TGT – Math)
6. Mr. Balwant Kumar (TGT – Math)

LINEAR EQUATION

1. In a village primary school enrolment of girls has doubled this year as compared to last year. Considering this year's enrolment as 'y' and previous year's enrollment as x :

   (a) Form a linear equation for this information.

   (b) If previous year's enrolement was 35 find this year's enrollment.

   (c) What is the value depicted here ?

2. On her birthday Sonia distributed chocolates in an orphanage. She gave 5 chocolates to each child and 20 chocolates to adults. Taking number of children as x and total chocolates distributed as y.

   (a) Form a linear equation.

   (b) If she distributed 145 chocolates how many children are there in the orphanage ?

   (c) Explain the value depicted here by Sonia.

3. In a housing society people decided to do Rainwater harvesting. Rainwater is collected in the underground tank at the rate of 30 cm^3/sec. Taking volume of water collected in x sec as y cm^3.

   (a) Form a linear equation.

   (b) Write it in standard form as ax+by+c=0.

   (c) Which value is promoted by the members of this society ?

4. A man hires an auto rickshaw to cover a certain distance. The fare is Rs. 10 for first km and Rs. 7 for subsequent kilometers. Taking total distance covered as x km and total fare as y :

   (a) Write a linear equation for this.

   (b) The man covers a distance of 16 km and gave Rs. 120 to the auto driver. Auto driver said ''It is not the correct amount'' and returned him the balance. Find the correct amount paid back by the autodriver.

   (c) Which value is depicted here by the autodriver ?

5. In a "Cleanliness drive" residents of certain locality joined together to clean neighbourhood area. Participation of children was 20 more than that by adults. Taking x as number of adults and y as number of children.

   (a) Form a linear equation.

   (b) What values are depicted here ?

6. Rehman and Prakash together contributed Rs. 500 towards Prime Minister Relief fund.

   (a) Write the linear equation for this.

   (b) Write the values involved in it.

7. Draw the graph of the linear equation $2(x+1)=3(y-1)-4$ and check whether point $(-3, +1)$ lies on the line ?

   Which value is depicted here ?

8. In a class, teacher asked about the equ. of line passing through the origin with options as :

   $y+x=1$, $x+3y=2$, $x+y=0$

   Rehana answered it correctly as $x+y=0$.

   Choose the correct value :

   (a) Honesty (b) Equality (c) Truthfulness (d) Sincerity

9.

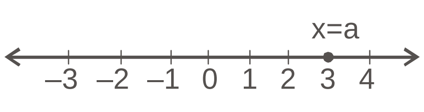


Fig. (i)

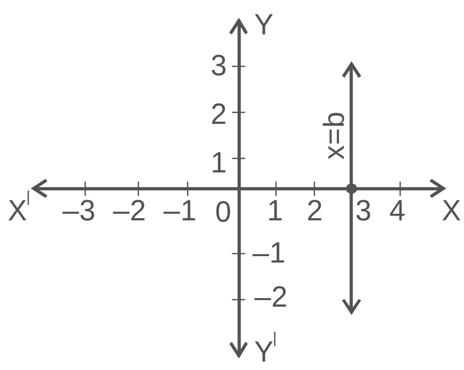


Fig. (ii)

(a) In the above fig. (i) & (ii) find the values of a & b.

(b) Is a=b ? Justify your answer.

(c) What is the value depicted here ?

10. (a) Every six months price of petrol increases at the rate of Rs. 4 per litre. Taking price of petrol in Dec. 2011 as 'x' and present price of petrol as 'y' form a linear equation showing amount spent on petrol in Dec. 2012.

(b) Due to continuous rise in the petrol price people are shifting towards CNG in place of petrol whose price increases at a rate of Rs. 3 per litre in a year. Form a linear equation taking price of CNG in Dec. 2011 as 'a' and in Dec. 2012, as 'b'.

(c) Which fuel will you prefer and why ?

(d) Which value is depicted by using CNG over petrol ?

ANSWERS

1. (a) $y=2x$

(b) $y=2\times35=70$

(c) Freedom, Gender equality.

2. (a) $y=5x+20$

(b) $145=5x+20$

$\Rightarrow 125=5x$

$\Rightarrow x=25$

(c) Happiness, Helpfulness

3. (a) $y=30x$

(b) $30x-y+0=0$

(c) Environmental protection, Co-operation.

4. (a) $y=10+7(x-1)$

$=10+7x-7$

$y=7x+3$

(b) $y=7\times16+3$

$=112+3=115$ Rs. Amt. Paid back = $120-115 = 5$ Rs.

(c) Honesty, Truthfulness.

5. (a) $y=x+20$

(b) Co-operation, Happiness, Sincerity, Environmental protection.

6. (a) $x+y=500$

(b) Co-operation, Helpfulness

7. (a) Equation

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

$\Rightarrow 2x+2=3y-3-4$

$\Rightarrow 2x-3y+9=0$

Point $(-3, +1)$ lies on it as

$2\times(-3)-3(+1)+9 = -6 - 3+9$

$= -9 + 9 = 0 =$ RHS.

(b) Curiosity, Truthfulness, Scientific temper.

8. (c) Truthfulness

9. (a) $a=3$, $b=3$

(b) Yes

(c) Scientific temper, Truthfulness, Knowledge.

10. (a) $y=x+8$

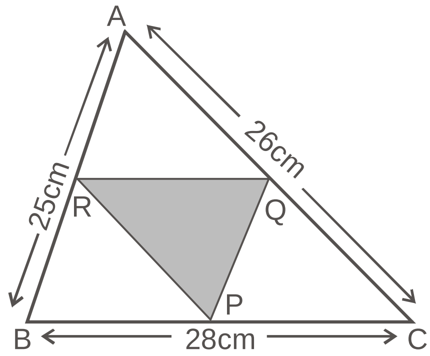
(b) $b=a+3$

(c) CNG, because CNG is cheaper than petrol.

(d) Environmental protection.

QUADRILATERALS

1.



There is a visit in a school by Directorate of Education. Girls are asked to prepare Rangoli in triangular shape. Dimensions of ΔABC are 26 cm, 28 cm, 25 cm. Garland is to be placed along the side of ΔPQR which is formed by joining midpoints of sides of ΔABC.

(a) Find the length of garland.

(b) What values are depicted here ?

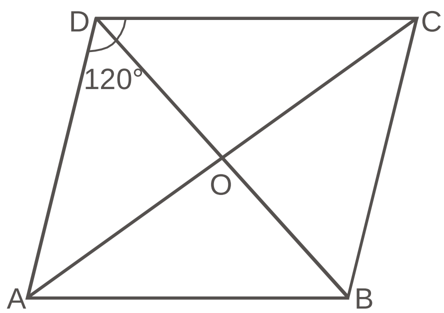
2. A class teacher gave students coloured papers in the shape of quadrilateral. She asked them to make parallelogram from it using paper folding.

(a) How can a parallelogram be formed by using paper folding ?

(b) Prove that it is a parallelogram.

(c) What values are depicted here ?

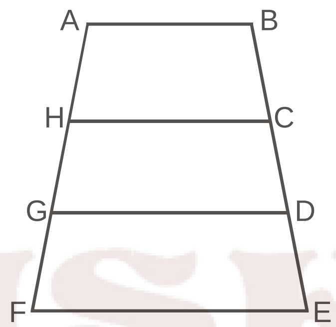
3. ABCD is a rhombus where $\angle ADC = 120°$. There are two fire stations at C and D and fire is reported at O.



(a) Which fire station team can reach early and why ?

(b) Which value is depicted here ?

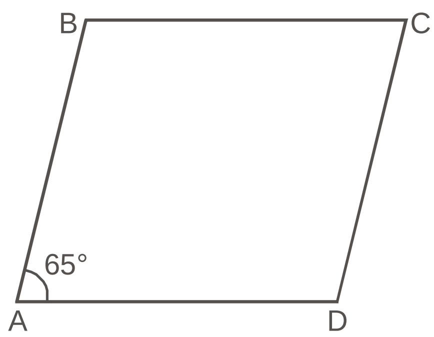
4. Sohan wants to show gratitude towards his teacher by giving her a card made by him. He has three pieces of trapezium pasted one above the other as shown in the fig. These pieces are arranged in a way that AB || HC || GD || FE. Also BC=CD=DE and GF=6 cm. He wants to decorate the card by putting up a coloured tape on non parallel sides of trapezium.



(a) Find the total length of coloured tape required if DE = 4cm.

(b) Which value is depicted by the student ?

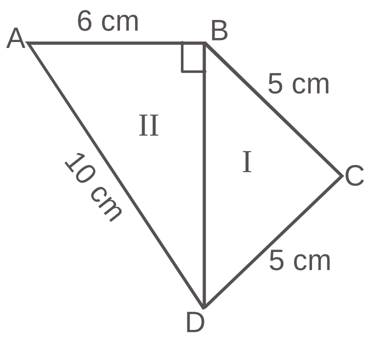
5. A farmer has a field in the form of a parallelogram ABCD. One of his cow is suffering from some disease. To take good care of her, he tied the cow at one corner of the field. The corner angle of the field is 65°.



(a) Find all the other three angles of the field.

(b) Explain the values depicted here.

6. A chocolate is in the form of a quadrilateral with sides 6 cm, 10 cm, 5 cm, 5 cm is cut into two parts along one of its diagonals by a lady. Part I is given to her maid and part II is equally divided among her driver and maali.



(a) Is this distribution fair ? Justify it.

(b) What value is depicted here ?

7. While analysing properties of quadrilateral a child says that all angles of a quadrilateral can not be obtuse.

(a) Justify his answer.

(b) What value is depicted in this activity ?

8. During Maths Lab Activity each student was given four broom sticks of lengths 8 cm, 8 cm, 5 cm, 5 cm to make different types of quadrilaterals.

(a) How many quadrilaterals can be formed using these sticks.

(b) Name the types of quadrilaterals formed.

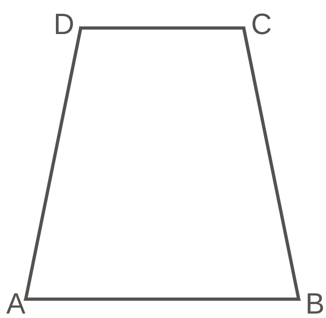
(c) While doing this activity which value is depicted ?

9- In a trapezium ABCD DC || AB and $\angle A = \angle B = 45°$. teacher asked the student to find $\angle D$.Naresh

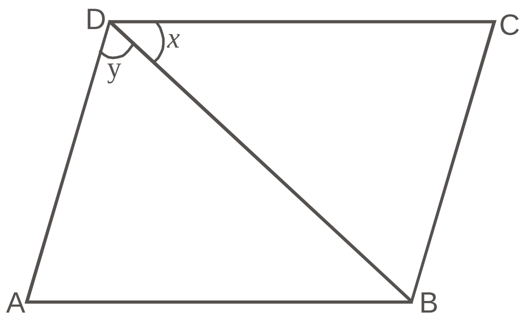
answered it as 135°

(a) Is the answer correct ? Justify it.

(b) Which value is depicted here ?



10- While discussing the properties of a parallelogram teacher asked about the relation between two angles x and y of a parallelogram as shown in the fig. Teacher gave them three options as :



(i) x > y (ii) x < y (iii) x = y

Beena gave the answer as x < y

(a) Is this the correct answer ?

(b) Justify the answer with suitable logic.

(c) What is the value depicted in this ?

QUADRILATERALS

ANSWERS

1. (a) RQ | | BC and RQ = $\frac{1}{2}$BC

(Mid pt. theorem)

$\Rightarrow$ RQ = 14 cm

QP = 12.5 cm

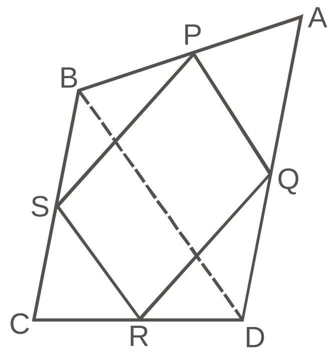
PR = 13 cm

Perimetre = 14+12.5+13

= 39.5 cm

(b) Beauty, happiness, co-operation

2.



(a) By joining mid pts. of sides of a quadrilateral.

(b) In Δ ABD

P & Q are mid point of AB and AD

$\therefore PQ \parallel BD \;\&\; PQ = \frac{1}{2}BD$ ....(i) (Mid point theorem)

similarly, $RS \parallel BD \;\&\; RS = \frac{1}{2}BD$ ....(ii)

from (i) & (ii) PQRS is a parallelogram

(c) Curiosity, Happiness, Scientific Temper

3. (a) D will send the team early $\angle ODC = 60°$ & $\angle OCD = 30°$

$\Rightarrow$ OC > OD (side opp. to larger angle is longer)

(b) Serving the people with honesty

4. (a) $AB \parallel HC \parallel GD \parallel FE$ and $BC = CD = DE$

$\Rightarrow AH = HG = GF$

(given three parallel lines making equal intercepts on any transversal then they will make equal intercepts on other transversal also)

$\because$ AF+FE = 18+12 = 30 cm

(b) Happiness, beauty, knowledge

5. (a) $\angle A = \angle C = 65°$

$\angle B = 180° - 65°$

$= 115° = \angle D$

(b) Helpfulness, caring for every one

6. (a) Distribution is fair

(b) $BD = \sqrt{AD^2 - AB^2} = \sqrt{100 - 36} = \sqrt{64}$

$BD = 8$ cm

$$\text{ar (ABD)} = \frac{1}{2} \times 6 \times 8$$

$= 24$ cm^2

ar (BCD)

$$S = \frac{a+b+c}{2} = \frac{5+5+8}{2} = 9 \text{ cm}$$

$$\text{area} = \sqrt{9 \times (9-5) \times (9-5) \times (9-8)}$$

$$= \sqrt{9 \times 4 \times 4 \times 1}$$

$= 12$ cm^2

(c) Helpfulness, Caring

7. (a) If $\angle A = 91°$, $\angle B = 91°$, $\angle C = 91°$ then $\angle D < 90°$

as $\angle A + \angle B + \angle C + \angle D = 360°$

(b) Scientific temper, knowledge

8. (a) Three type of quadrilaterals can be formed

(b) Rectangle, parallelogram, kite

(c) Scientific temper, curiosity

9. (a) DC | | AB

$\Rightarrow \angle A + \angle D = 180°$

$\Rightarrow \angle D = 180° - 45° = 135°$

(b) Scientific temper, truth value

10. (a) Yes

(b) $\angle ADB = \angle DBC = y$ (alternate int. angles)

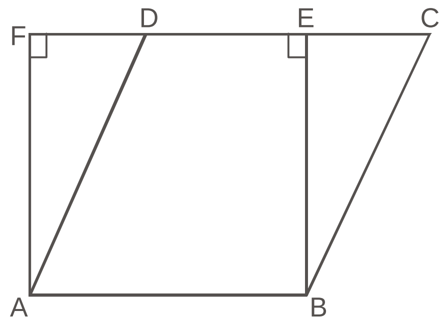
since BC < CD (angle opp. to smaller side is smaller)

$\therefore\ x < y$

(c) Truth value

AREAS OF PARALLELOGRAMS AND TRIANGLES

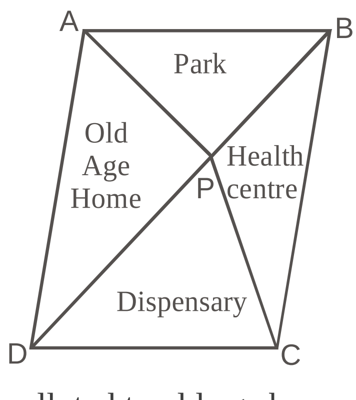
1. A craft mela is organised by Welfare Association to promote the art and culture of tribal people. The pandal is to be decorated by using string of bulbs all around the field. There are two options either to arrange it in a rectangular field ABEF or parallelogram ABCD with equal area.



   (a) What shape of the field should be chosen to minimise the expense of bulb and why ?

   (b) Which values are depicted here ?

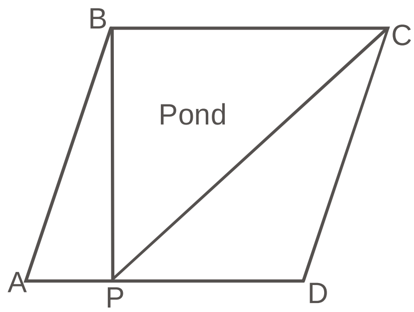
2. A plot is in the form of a parallelogram ABCD. Owner of this plot wants to build OLD AGE HOME, DISPENSARY, PARK and HEALTH CENTRE for elderly people as shown in the fig. P is a point on the diagonal BD.



   (a) Prove that area alloted to old age home and dispensary is same.

   (b) Which values are depicted here ?

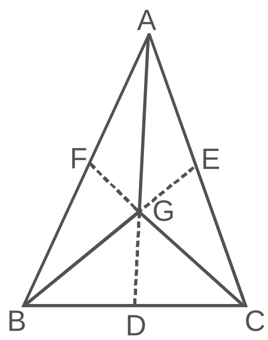
3. There was a deserted land near a colony where people used to throw garbage. Colony people united to develop a pond in triangular shape as shown in the fig. The land is in the shape of | |gm ABCD. In rest of the portion medicinal plants were grown. If area of parallelogram ABCD is 200 m^2.



(a) Calculate the area where medicinal plants were grown.

(b) Which value is depicted here ?

4. For 'Sarva Shiksha Abhiyan' a rally was organised by a school. Students were given triangular cardboard pieces to write slogans. They divided the triangular shape into three equal parts by drawing medians as shown in fig.



(a) Prove that area (AGC) = area (AGB)

$$= \text{area (BGC)}$$

$$= \frac{1}{3} \text{ area (ABC)}$$

(b) Which values are inculcated through this activity ?

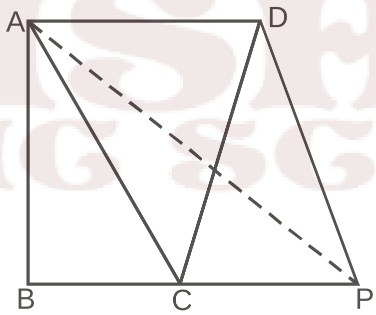
5. A farmer has a square plot of land where he wants to grow five different crops at a time. On half of the area in the middle he wants to grow wheat but in rest four equal triangular parts he wants to grow different crops.

   (a) Explain by diagram how he can divide the area to fulfill his purpose.

   (b) By using this crop pattern which values are depicted by the farmer?

6. There is a plot in a village in the shape of a quadrilateral ABCD. Sarpanch wants to get floor cemented so as to use it for social gatherings and panchayat meetings. Later due to construction of park in the neighbourhood for children they decided to change the shape to triangle ABP.

   If AC || DP



   (a) Prove that ar (quad. ABCD) = ar (Δ ABP)

   (b) What are the values depicted in this activity ?

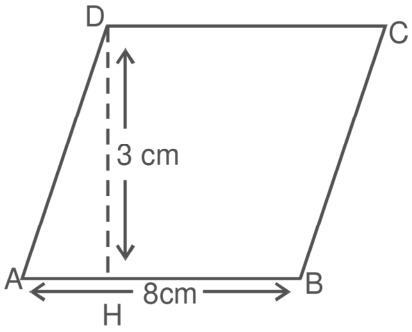
7. On National Integration day a poster is to be made by class IX students of a school. This poster is in the shape of a parallelogram. All religions should be given equal triangular space to display their teachings.

   (a) How will they divide a parallelogram into four triangles equal in area ? Justify it.

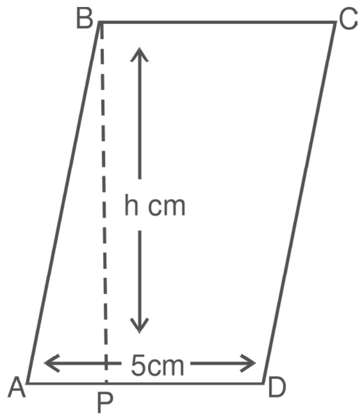
   (b) What are the values depicted here ?

8. In a class, teacher gave two identical carboard pieces which are in the shape of a parallelogram to two groups. First group was asked to find

area of parallelogram using AB as base. Then another group was asked to find height (h) of the parallelogram with AD as base.



Group (I)



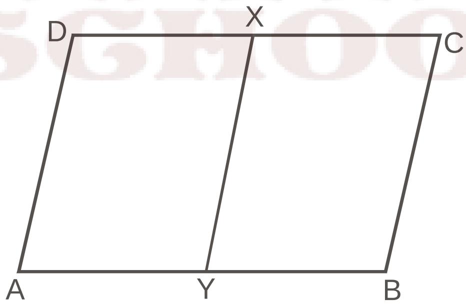
Group (II)

(a) How will they find value of h ?

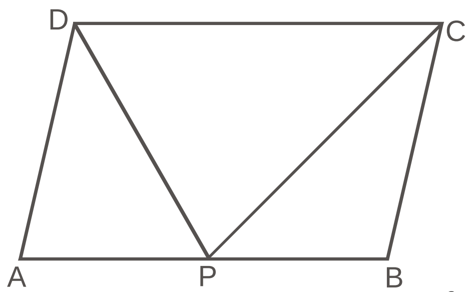
(b) What are the values involved here ?

9. In a class, teacher asks the students to cut a figure from a given parallelogram which has area equal to half the area of parallelogram ABCD.

Sunita joins the mid points of opposite sides of parallelogram as shown in the fig.



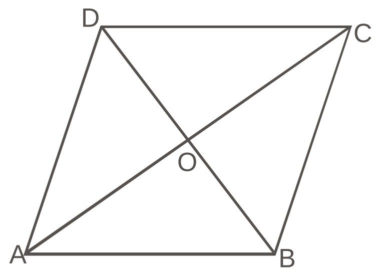
Where as Rohan draws a triangle on the same base as shown in fig.



(a) State whether two answers are correct. Justify.

(b) What values are depicted from this activity ?

10. In a rhombus ABCD, AC = 8 cm, then AO = 4 cm.



The statement shows

(a) Truth value (b) Social value

(c) Environment value (d) Cooperation

Justify your answer.

<u>ANSWER</u>

1. (a) Rectangle as

Perimeter of rectangle < Perimeter of parallelogram

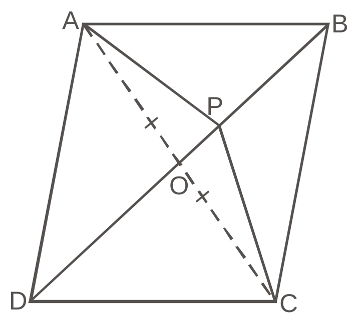
(b) Co-operation, helpfulness

2. (a) Join AC

Diagonals AC & BD of a | |gm ABCD bisect at O.

$\Rightarrow$ AO = OC and BO = OD

In ΔAPC, PO is median ($\because$ Median divides a triangle in two triangles equal in area)



$\therefore$ ar (APO) = ar (CPO) .... (i)

In ΔADC,

DO is median

$\therefore$ ar (ADO) = ar(DCO) .... (ii)

Adding (i) & (ii)

ar (APO) + ar (ADO) = ar (CPO) + ar (DCO)

$\Rightarrow$ ar (ADP) = ar (DPC)

(b) Helpfulness, happiness, cooperation

3. (a) 100 sq. cm.

(b) Environmental protection, cooperation

4. (a) In Δ ABC, AD is median

$\therefore$ ar (ΔABD) = ar (ΔADC) _______ (i)

also ar (ΔGBD) = ar (GDC) _______ (ii)

subtracting (ii) from (i)

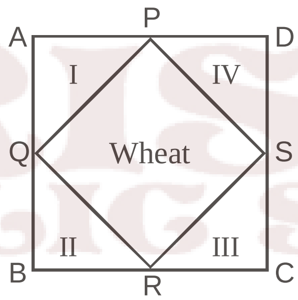
ar (ΔAGB) = ar (ΔAGC)

similarly

ar (AGB) = ar (AGC) = ar (GBC)

(b) Cooperation, sincerity

5. (a)



joining midpoints of sides

(b) Increases fertility of soil, environmental protection, happiness.

6. (a) Since AC || DP

ar (ADC) = ar (APC) ....(i)

($\because$ triangles on the same base AC and between same parallels AC & DP are equal in area)

Adding ar (ΔABC) to both sides of (i)

ar (ADC) + ar (ABC) = ar (APC) + ar (ABC)

$\Rightarrow$ ar (ABCD) = ar (ABP)

(b) Environmental protection, respecting others views

7. (a) Diagonals of a | | gm divides it into four triangles of equal area.

(b) Unity of nation, co-operation, fraternity

8. (a) Area of | |gm ABCD

$AB \times DH = AD \times BP$

$8 \times 3 = 5 \times h$

$$\frac{8 \times 3}{5} = h$$

$$\frac{24}{5} = h$$

$h = 4.8$ cm.

(b) Scientific temper, cooperation

9. (a) Both are giving correct answer.

(b) Scientific temper, curiosity, co-operation.

10. (a) Truth value

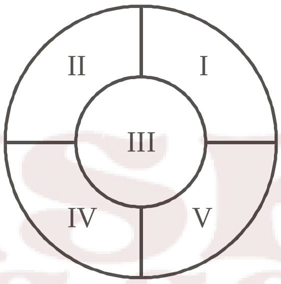
CIRCLES

1. Three friends ordered 3 pizzas of same size for them. Just then two more friends joined them. They decided to share 3 pizzas among all 5 of them.

   (a) Find the area of the share of pizza each child gets if the radius of each pizza is 7 cm.

   (b) Which values of children are depicted here ?

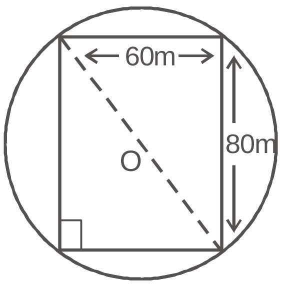
2. During 'Van Mahotsav' celebration in a school a circular plot in the corner of the school was chosen. Five groups of students were selected to plant trees in each part as shown in the fig.



   (a) Which group gets the maximum area to develop and by how much, if the two radii are 210 cm & 105 cm respectively.

   (b) What values can be inculcated in students through this activity ?

3. The Indian hockey federation organized a friendly hockey match between India and Pakistan on a circular ground. The sale proceeds of this match shall be donated to an orphanage. A rectangular turf is spread on the ground as shown in the figure.

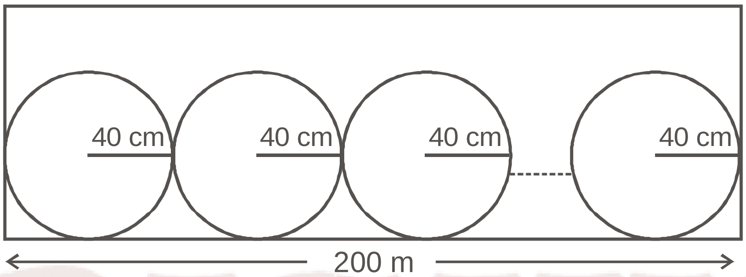


(a) Find the radius of the stadium.

(b) Which social values is depicted here ?

(c) How does donation to charitable organisations help in the development of society ?

4. A school decided to paint its inner boundary wall. They planned to write quotations and social messages for the children on the circular areas of radius 40 cm each on the wall along a straight line.

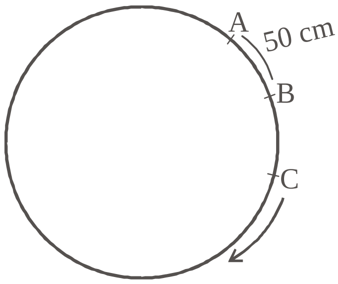


If the boundary wall is 200 m long

(a) How many circles can be drawn ?

(b) What values are inculcated in the students by this activity ?

5. A group of 66 students went for a picnic. They halted at a park for their lunch. They made a big circle and each child was 50 cm away from the other child along the circle.

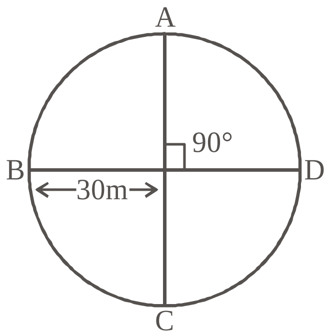


(a) Find the radius of the circle they formed.

(b) What values do these students possess ?

6. An amusement fair was organised in a circular park for the children of slum clusters. Free food was supplied to them at 4 stalls situated at

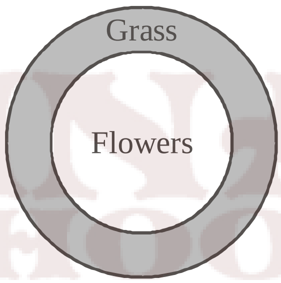
A, B, C and D as shown in the figure.



(a) Find the distance between any two adjacent food stalls if the radius of the park is 30 m.

(b) Are such activities helpful for society ? What are the other social issues for which such compaigns are required ?

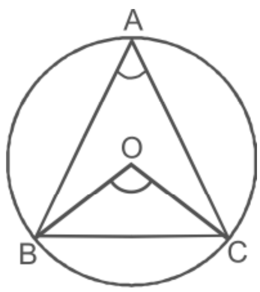
7. Children of a colony decided to assist and help an old couple of the colony in developing their vacant plot as flower bed as shown here. The radii of the two circles is 245 cm and 210 cm.



(a) Find the area of the grass cover.

(b) Which values are depicted by the children?

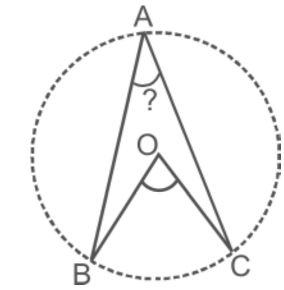
8. 3 STD booths situated at A, B and C in the fig. are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure.



(a) Find $\angle BOC$

(b) Do you think employment provided to handicapped persons is important for the development of a society ? Justify your answer.

9. During a practical activity in maths lab, students were using circular Geo board. The angle subtended by an arc at the centre is $(2a+50°)$ Sakshi calculated $\angle BAC$ as $(a+25°)$

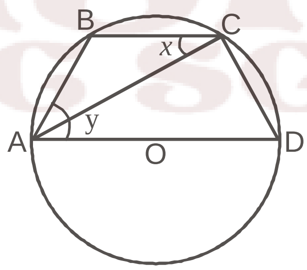


(a) Is her finding correct ? Justify it.

(b) Find $\angle BAC$ if $a = 30$

(c) Which values are depicted here ?

10. In a circle with centre O, ABCD is a cyclic quadrilateral.



$x+y = 90°$ depicts which of these values ?

(a) Social value (b) Freedom

(c) Truth value (d) Gender equality

Justify your answer.

ANSWERS

1. (a) $92.4\ cm^2$ (b) co-operation
2. (a) Group III, 8662.5 sq. cm
   (b) Environmental protection, beauty
3. (a) 50 m (b) Helpfulness, co-operation
   (c) This money is utilized for welfare of orphans.
4. (a) 250 (b) Beauty
5. (a) 5.25 m (b) Co-operation, happiness
6. (a) $30\sqrt{2}$ m
   (b) Yes, for the inmates of old age home, orphanages, handicapped children etc.
7. (a) 50050 sq. cm (b) Helpfulness
8. (a) 120° (b) Yes
9. (a) Yes (b) 55° (c) Truth, scientific temper
10. $\angle ACD = 90°$

    $\angle BAD + \angle BCD = 180°$ (opposites angles of a cyclic quadrilateral)

    $y+x+90 = 180$

    $\therefore \quad x + y = 90°$

    Truthfulness, knowledge

CONSTRUCTION

1. Delhi traffic police wants to make a traffic signal board of the shape of an equilateral triangle of side 5 m to make the people aware of the traffic rules. Construct the above traffic signal board by taking each side as 5 cm (instead of m). What value is depicted here ?

2. Ram Lal has a triangular piece of land ABC in which $\angle B = 30°$, $\angle C = 90°$, AB+BC+CA = 11 m. He donated this to a vridhashram. Construct a triangle using above dimensions (use cm in place of m). What value represents here ?

3. Students of a school staged a rally for cleanliness campaign. They walked through the lanes AB, BC and CA which form a triangle. Construct the ΔABC in which BC = 8m, $\angle B = 45°$ AB–AC = 3.5m. What value represents here ? (Construct the triangle using cm in place of m)

4. A co-operative house adopted a triangular park Δ PQR to maintain its greenary of dimensions QR = 7m, $\angle Q = 75°$ and PQ + PR = 13m, Make a Δ PQR using cm instead of m. What value represents here ?

5. The villagers of a village wish to make a pool to drink water for animals. They constructed it in the shape of a triangle. The dimensions of the pool are 5m and 12m and the angle between them is 90°. Construct it by taking as cm instead of m. What value represents here?

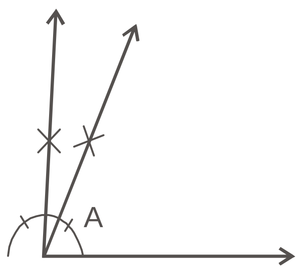
6. Mohan and Sohan constructed a right angle. Choose the correct option. What idea is depicted here?

(a) Mohan is correct (b) Sohan is correct

(c) Both are correct (d) Both are wrong

7. Kavita makes a triangular shaped carpet of dimensions 5m, 5m and 6m and donates it to a blind school. Construct a triangle using the above dimensions in cm. What value represents here ?

8. Choose the correct option for $\angle A$—



(a) $60+\frac{1}{2}\times 60$ (b) $60+\frac{1}{4}\times 60$

(c) $60+\frac{1}{3}\times 60$ (d) $60+\frac{1}{5}\times 60$

What value is depicted here ?

9. Panther club made a tent to save poor people during winter season. They made its door triangular shape of sides 3m, 4m, 5m. Construct the door taking measurements of sides in proportion. What ideas are being promoted by the club ?

10. A retired army officer wish to make an orphan house of right triangular shape in which one side is 13.5 m and sum of other side and hypotenuse is 15.5 m. Construct the triangle taking measurements in cms. What ideas promote here ?

ANSWERS

1. (a) Do correct construction

   (b) To make the people aware of traffic rules for safety measures.

2. (a) Do correct construction

   (b) Habit of donation

3. (a) Do correct construction

   (b) To make the environment clean.

4. (a) Do correct construction

   (b) (i) To make the environment clean.

   (ii) Community services

5. (a) Do correct construction

   (b) Social work

6. (a) Mohan is correct

   (b) Truth value

7. (a) Do correct construction

   (b) Habit of donation, social work

8. (a) $60+\frac{1}{4}\times 60$

   (b) Truth value

9. (a) Do correct construction

   (b) Community services, Social services

10. (a) Do correct construction

    (b) Community services

SURFACE AREAS AND VOLUME

1. By stating the formula for the volume of cone as

$$v = \frac{1}{3}\pi l^2 h - \frac{1}{3}\pi h^3$$

the following value is depicted.

(a) Truth value (b) Social value

(c) Respect for other views (d) Equality

2. 50 students of class X planned a visit to an old age home and to spend the whole day with its inmates. Each one prepared a cylindrical flower vase using cardboard to gift the inmates. The radius of cylinder is 4.2 cm and the height is 11.2 cm.

(a) What is the amount spent for purchasing the cardboard at the rate of Rs. 20 per 100 m^2 ?

(b) Which value is depicted by the students ?

3. In a flood hitted area, the volunteers of NSS erected a conical tent made of tarpaulin. The vertical height of the conical tent is 4m and the base diameter is 6m. If the width of tarpaulin is 1.5m then.

(a) Find the length of the tarpaulin used, assuming that 10% extra material is required for stitching margins and wastage in cutting. (Take $\pi = 3.14$)

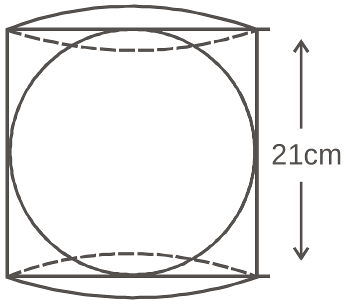
(b) Which value is depicted by the volunteers ?

4. On a construction site, a deep pit is barricaded from the remaining portion by using 50 hollow. Cones made of recycled plastic. Each cone has a base diameter of 40 cm and height 1 m.

(a) What is the cost of painting all the cones if the outer side of each of the cones is to be painted and the cost of painting is Rs. 12 per m^2. (Take $\pi = 3.14$ and $\sqrt{1.04} = 1.02$)

(b) Name the values

5. Ashwani a factory owner wants to thank all his workers by gifting a decorated spherical ball. The diameter of the sphere is (2a+5) cm. Each ball is to be packed in a right circular cylindrical box which just encloses a sphere as shown in the figure.



If the height of the cylinder is 21cm then

(a) What is the value of ‘a’ ?

(b) What is the curved surface area of a sphere ?

(c) Which value is shown by Ashwani ?

6. A residential colony has a population of 5400 and 60 litres of water is required per person per day. For the effective utilization of rain water, a group of people decided to do WATER HARVESTING. They constructed a water reserviour measuring 48m × 27m × 25m to collect the rain water.

(a) For how many days the water of this tank is sufficient if during rain the height of water level is 5m.

(b) Which value is shown by the group of people ?

7. The patients in a hospital are given soup daily in a cylindrical bowl of diameter 7cm. On a particular day, the girls of KANYA MAHAVIDYALAYA decided to cook the soup for the patients. If they fill the bowl with soup to a height of 5cm then how much soup is to be cooked for 300 patients ? Which value is depicted by the girls ?

8. The resident of society decided to paint the hall of cancer detective centre in their premises. If the floor of the cuboidal hall has a perimeter equal to 250 m and height 6m then

(a) Find the cost of painting its four walls (including doors etc) at the rate of Rs. 8 per m^2.

(b) What is the amount contributed by 50 people ?

(c) Which value is depicted by the residents ?

9. Sunidhi is curious to find out the relationship between the diameter of the moon and the earth. From the data available, it is known that the volume of earth is 64 times the volume of the moon. She concluded that the diameter of the moon is $\frac{1}{4}$ of the diameter of the earth.

   (a) Justify her statement by proving it.

   (b) Which value is depicted by Sunidhi by conducting the experiment?

10. There are 100 students in a blind school. Mr. and Mrs. Ramesh wished to serve them milk. They have two options for serving the milk.

    Option A – A hemispherical bowl with radius 10.5 cm made up of ecofriendly material.

    Option B – A hemispherical bowl with radius 7 cm made up of plastic.

    (a) How many litres of milk is required if option A is taken.

    (b) Find the total quantity of milk (in litres) if option B is taken.

    (c) Mr. and Mrs. Ramesh opted for option A which value is shown by them.

ANSWERS

1. volume of cone = $\frac{1}{3}\pi r^2 h$ ....(i)

   also $l^2 = r^2 + h^2$

   $r^2 = l^2 - h^2$ ....(ii)

   substituting (ii) in (i) we get,

   $$v = \frac{1}{3}\pi\left(l^2 - h^2\right)h$$

   $$= \frac{1}{3}l^2 h - \frac{1}{3}\pi h^3$$

   so ans. is (a)

2. (a) $r = 4.2$ cm., $h = 11.2$ cm

S.A. of cylindrical vase = C + area of base

$$= 2\pi rh + \pi r^2$$

$$= 2\pi \times 4.2 \times 11.2 + \pi(4.2)^2$$

$$= 4.2\,\pi\,(22.4 + 4.2)$$

$$= 4.2 \times \frac{22}{7} \times 26.6$$

$$= 351.12 \text{ cm}^2$$

of 50 cylinder $= 50 \times 351.12$

$$= 17556 \text{ cm}^2$$

Total cost $= 17556 \times \frac{20}{100}$

$$= \text{Rs. } 3511.20$$

(b) Social value / co-operation / caring for old people.

3. (a) C of conical tent $= 3.14 \times 3 \times \sqrt{3^2 + 4^2}$

$$= 47.1 \text{ m}^2$$

Area of trapaulin used $= (47.1 + 10\% \text{ of } 47.1) \text{ m}^2$

$$= 51.81 \text{ m}^2$$

Required length of trapaulin $= \frac{51.81}{1.5}$ m

$$= 34.54 \text{ m}$$

(b) Social value, helpfulness

4. (a) $r = 20$ cm $= 0.2$ m

$h = 1$m

$l^2 = h^2 + r^2 = 1 + .04 = 1.04$

$l = \sqrt{1.04} = 1.02$ m

curved S.A of 50 cones = $(50 \times 3.14 \times 0.2 \times 1.02)\ m^2$

$= 32.028\ m^2$

Total cost of painting = Rs. 12×32.028

= Rs. 384.34

(b) Social value, environmental protection.

5. (a) diameter os sphere = height of cylinder

$2a + 5 = 21$

$2a = 21 - 5 = 16$

$a = 8$

(b) C of sphere = $4 \pi r^2$

$$= 4 \times \frac{22}{7} \times \frac{21}{2} \times \frac{21}{2}$$

$= 1386\ cm^2$

(c) Social justice, caring

6. (a) Total volume of water = $(48 \times 27 \times 5)\ m^3$

$= 48 \times 27 \times 5 \times 1000$ litres

Requirement of water for one day = 5400×60 litres

No. of days = $\frac{48 \times 27 \times 5 \times 1000}{5400 \times 60}$

= 20 days

(b) environmental value, co-operation

7. (a) Volume of the cylinder = $\pi r^2 h$

$$= \pi \times \left(\frac{7}{2}\right)^2 \times 5$$

$$= \frac{22}{2} \times \frac{7}{2} \times \frac{7}{2} \times 5$$

$$= \frac{385}{2}\ cm^3$$

volume for 300 patients = $\frac{385}{2} \times 300$

$= 57750 \text{ cm}^3$

$= 57.750$ litres

(b) Social cohension, happiness

8. P = 2(l+b) = 250

= l + b = 125

(a) Surface area of four walls = 2h (l+b)

= 6 × 250

= 1500 m^2

cost = 8 × 1500

= Rs. 12000

(b) Amount contributed = Rs. 240

(c) Social value, co-operation, social cohension

9. (a) Volume of earth = 64 × volume of moon

$$\frac{4}{3}\pi R_1^3 = 64 \times \frac{4}{3}\pi R_2^3$$

$$\Rightarrow R_1^3 = (4R_2)^3$$

Radius of earth = 4 × Radius of moon

$\Rightarrow \frac{1}{4}$ Diameter of earth = Diameter of moon

(b) Curiosity, spirit of enquiry, scientific temper

10. (a) r = 10.5 cm

volume of hemisphere = $\frac{2}{3}\pi r^3$

Total volume = 2.42 × 100 = 242 *l*

(b) volume of hemisphere = $\frac{2}{3}\pi r^3$

$$= \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7$$

$= 718.6 \text{ cm}^3$

$= 0.719\ l$

Total volume = $100 \times 0.719 = 71.9\ l$

(c) Environmental value, social value

STATISTICS

1. The enrollment of a school during six consecutive years was as follows—

Year	2000	2001	2002	2003	2004	2005
Enrollment of school	1620	2060	2540	3250	3500	3710

   (a) Find the mean of the enrollment of the school for this period.

   (b) Draw a bar graph of the above data.

   (c) What value this data represent ?

2. Status of tigers in India in last 100 years is as follows—

Year	1900	1960	2002	2007
No. of Tigers	40,000	18,000	3642	1411

   (a) Make bar graph of above data.

   (b) What idea promotes here ?

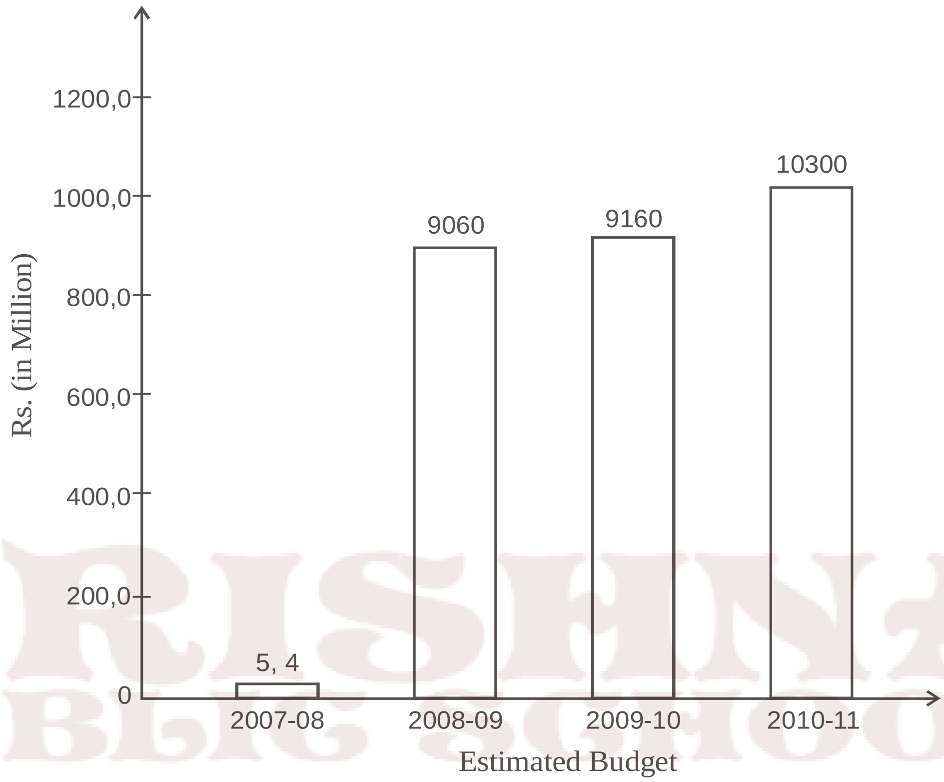
3. The following table shows the interest paid by India (in thousand crore rupees) on external debts during the period 1998-99 to 2002-03.

Year	1998-99	99-2000	2000-01	2001-02	2002-03
Interest (in thousand crore rupees)	70	84	98	106	120

   (a) Draw histogram of the above data.

   (b) What conclusion will derive from above data ?

4. The following bar garph represents the budget allocation by Govt. of NCT of Delhi under Ladli scheme.



This scheme started in January 2008.

Read the above bar graph and answer the following questions.

(a) In which year the budget was minimum ?

(b) In which year the budget was maximum ?

(c) What values are depicted from the above data ?

5. 25 plants each were planted in 25 schools during Van Mahotsava.

16	20	23	10	6
10	12	7	9	15
15	22	11	13	21
17	9	4	10	12
20	15	18	18	22

(a) Prepare a frequency distribution table of the above data using class interval 0-5 etc.

(b) What values are represented through this activity.

6. A group of 10 students visited to a blind school. They donated Rs. 100, 120, 125, 50, 75, 100, 150, 100, 75, 85.

(a) Find mean, mode, median of this data.

(b) What impression will you receive through this ?

7. The following data represents the power consumption of Delhi from 2001 to 2010.

Year	2001	2005	2006	2009	2010
Power demand (in MW)	2831	3490	3626	4408	4581

(a) Draw bar graph of above data.

(b) What represents through the above data.

8. The following data represents the cases of deptheria and death due to deptheria—

Year	2005	2006	2007	2008	2009
No. of cases of deptheria	47	50	45	190	340
Death due to deptheria	1	0	0	30	82

(a) In which year, the cases of deptheria were minimum ?

(b) In which year, the deptheria death occurs ?

(c) What value we draw from the above data ?

9. The following data represents the cases of whooping cough in India during the following years—

Year	2005-06	2006-07	2007-08	2008-09	2009-10
Cases	470	50	30	60	826

(a) Draw frequency polygon curve of the above data.

(b) What value represents this data ?

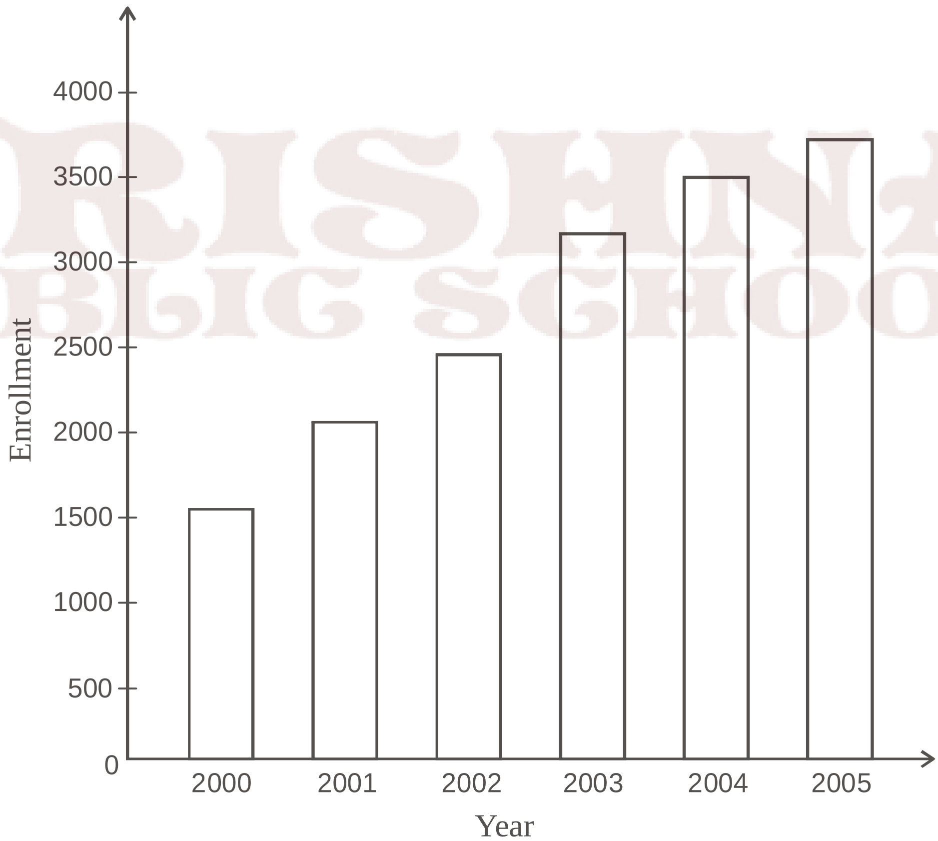
10. 10 people were asked about the time they spent in a week in doing social work in their community. They said 10, 7, 13, 10, 20, 15, 10, 14, 12, 16 hours resp. Find the mean, mode, median time in a week devoted by them for social work.

What value we draw from the above data ?

ANSWERS

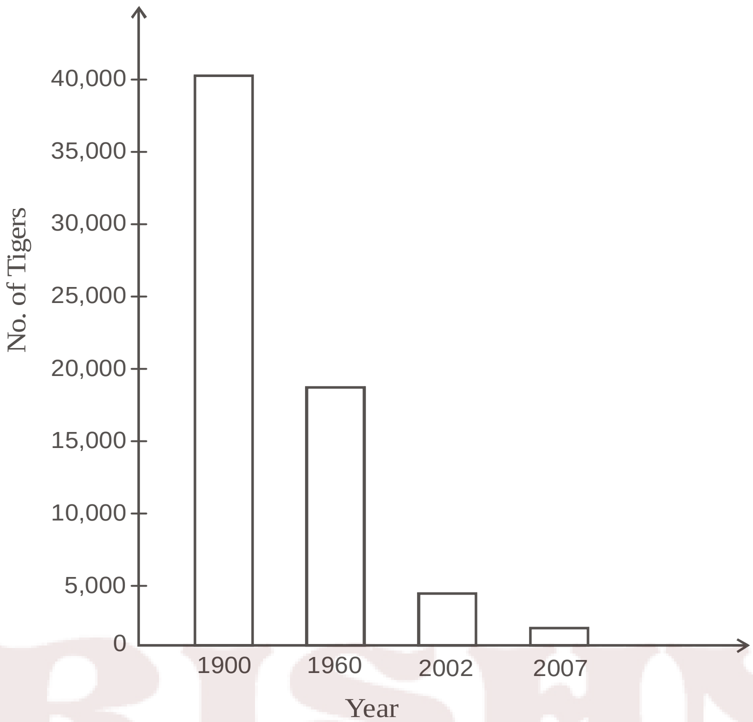
1. (a) 2780

(b)

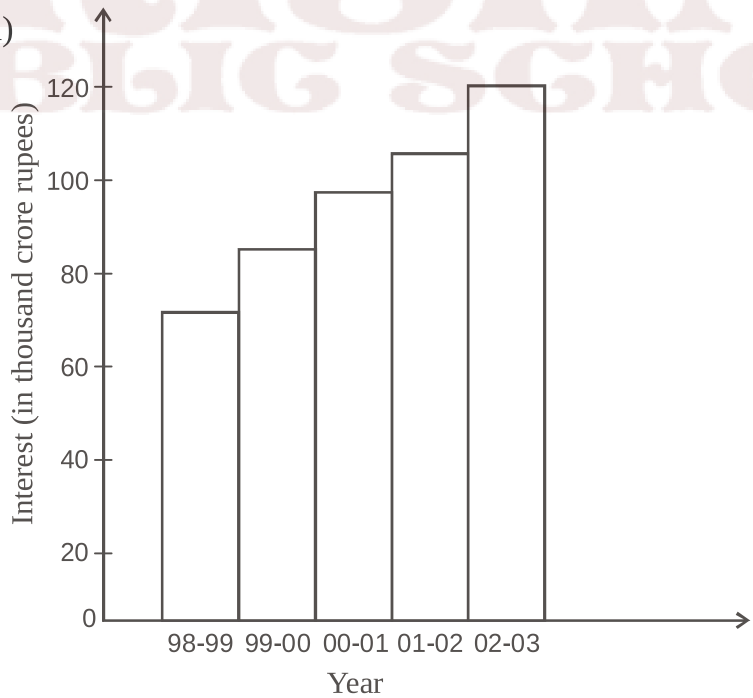


(c) Awareness of people towards education

2.



3. (a)



(b) We should try to be more self dependent.

4. (a) The budget was minimum in 2007-08.

   (b) The budget was maximum in 2010-11.

   (c) (i) Save the girl child.

   (ii) Improving school enrollment.

   (iii) Reducing insecurity among the parents having only daughter.

5. (a)

Class Interval	No. of plants
0-5	1
5-10	4
10-15	7
15-20	7
20-25	6

   (b) Conservation of earth by tree plantation.

6. (a) By arranging the data in ascending order, we get

   50, 75, 75, 85, 100, 100, 120, 125, 150

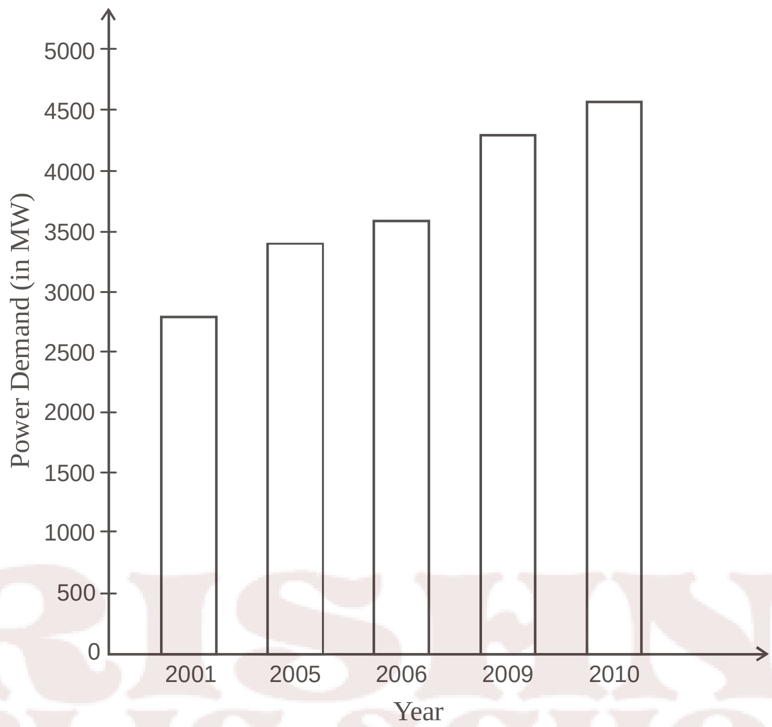
   Mean = $\frac{980}{10}$ = 98

   Mode = 100

   Median = $\left(\frac{5^{th} + 6^{th}}{2}\right)$term $= \frac{100+100}{2} = \frac{200}{2} = 100$

   (b) Habit of giving donation for social cause

7. (a)



(b) Save the electricity

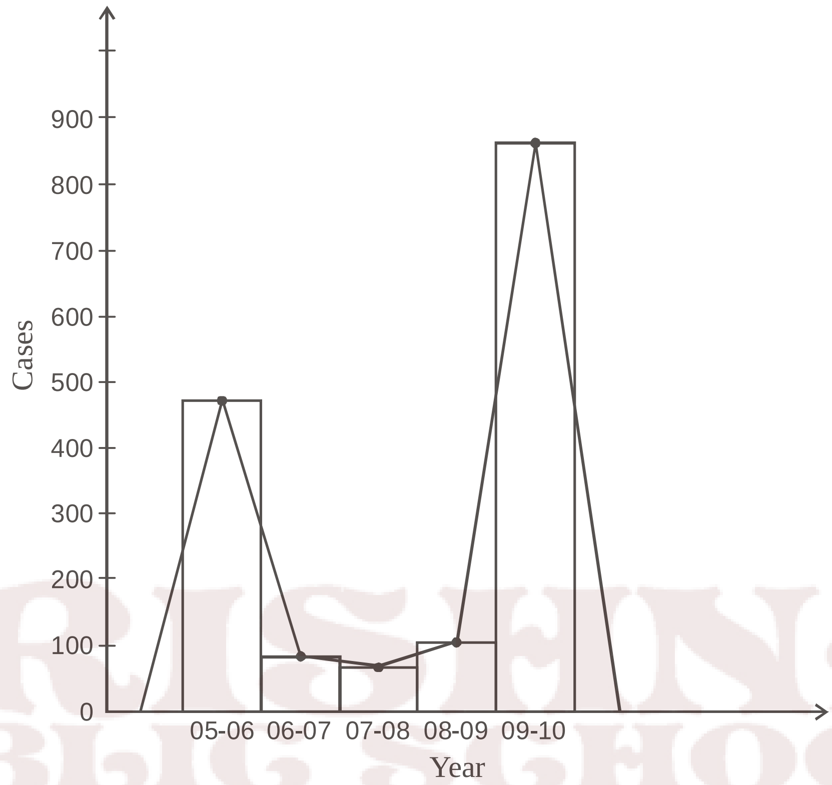
8. (a) In 2007, the cases of deptheria were minimum.

(b) In 2006 and 2007, no death due to deptheria occur.

(c) The vaccination programme should implemented to reduce cases as well as deaths due to deptheria.

(d) Community services

9. (a)



(b) Community services

10. (a) Arranging in ascending order

7, 10, 10, 10, 12, 13, 14, 15, 16, 20

Mean = $\frac{7+10+10+10+12+13+14+15+16+20}{10} = \frac{127}{10} = 12.7$

Mode = 10

Median = $\frac{5^{th}+6^{th}}{2}$ term = $\frac{12+13}{2} = \frac{25}{2} = 12.5$

(b) Social service

PROBABILITY

1. 1500 families with 2 children were selected randomly, and the following data were recorded—

No. of girls in a family	2	1	0
No. of families	800	500	200

(a) Compute the probability of a family having 2 girls.

(b) What value is promoted by this data ?

2. On the occassion of Independence Day celebration out of 1200 students, 900 students took part in this celebration.

(a) Evaluate the probability that the students participated in the celebration.

(b) What values are represented through this activity ?

3. Sita says that in word MADAM, the probability of letter M is equal to that letter A. Is she right? What value represents in it ?

4. In 1000 families 750 families have 1 child and rest of families have two children. Find the probability of having (a) 1 child and (b) two children

What value represents from this ?

5. In a colony, 920 out of 1000 people visited Radha Krishan Temple on the occassion of Janamashtmi. Find the probability of people not visited the temple. What value represents in this ?

6. In a school, 100 students took part in Van Mahotsava and helped each other in planting the tree.

Name of plants	Rose	Mari gold	Chameli	Jasmine
No. of plants	32	28	16	24

Find the probability of planting

(a) Rose (b) Jasmine

What value represents here ?

7. Mohan earns Rs. 30,000 in a month. He spends Rs. 25,000 on his needs. What is the probability of his saving ? What value is depicted from it ?

8. In a town out of 1000 persons, 998 are literate. Calculate the probability that a selected person is

   (a) Literate (b) Illiterate

   What value do this data represent ?

9. The blood groups of 15 students of class IX are recorded as follows—

   A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O, AB

   Find the probability of blood group—

   (a) O

   (b) A

   (c) What value do you draw from this activity ?

10. On Lajpat Nagar crossing, out of 100 people, 9 people jumped traffic light. Find the probability of people not jumping traffic light. What value is depicted from this ?

<u>ANSWER</u>

1. (a) $\dfrac{800}{1500} = \dfrac{8}{15}$

   (b) Promotion to girl child

2 (a) $\dfrac{900}{1200} = \dfrac{3}{4}$

   (b) Love for Nation

3. (a) $P(M) = P(A) = \dfrac{2}{5}$

   (b) Truth value

4. (a) $\frac{750}{1000}$ or $\frac{3}{4}$

(b) $\frac{250}{1000}$ or $\frac{1}{4}$

(c) (i) Population control

(ii) Small family is a happy family

5. (a) $\frac{80}{1000}$ or $\frac{2}{25}$

(b) Spiritual value

6. (a) $\frac{32}{100}$ or $\frac{8}{25}$

(b) $\frac{24}{100}$ or $\frac{6}{25}$

(c) (i) Environmental protection

(ii) Co-operation

7. (a) $\frac{5000}{30000}$ or $\frac{1}{6}$

(b) Habit of saving

8. (a) $\frac{998}{1000}$ or $\frac{499}{500}$

(b) $\frac{2}{1000}$ or $\frac{1}{500}$

(c) Literacy rate is high in cities.

9 (a) $\frac{7}{15}$

(b) $\frac{4}{15}$

(c) (i) Habit of donation

(ii) Social work

10 (a) $\frac{91}{100}$

(b) Society becomes aware to avoid accidents and save precious life.