DEHRADUN PUBLIC SCHOOL
ASSIGNMENT (2022-23)
SUBJECT- MATHEMATICS(041)
CLASS - IX

CHAPTER - 1 (NUMBER SYSTEMS)

Solve the following questions:

Q1. The product of any two irrational numbers is :

a. always an irrational number b. always a rational number

c. always an integer d. sometimes rational, sometimes irrational

Q2. Which of the following is not equal to $\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{-\frac{1}{6}}$:

a. $\left(\frac{5}{6}\right)^{\frac{1}{5}-\frac{1}{6}}$ b. $\frac{1}{\left[\left(\frac{5}{6}\right)^{\frac{1}{5}}\right]^{\frac{1}{6}}}$ c. $\left(\frac{6}{5}\right)^{\frac{1}{30}}$ d. $\left(\frac{5}{6}\right)^{-\frac{1}{30}}$

Q3. The number of rational numbers between $\sqrt{3}$ and $\sqrt{5}$ is :

a. one b. two c. three d. infinitely many

Q4. The arrangement of $\sqrt{5}, \sqrt{2}, \sqrt{3}$ in ascending order is :

a. $\sqrt{2}, \sqrt{3}, \sqrt{5}$ b. $\sqrt{5}, \sqrt{3}, \sqrt{2}$ c. $\sqrt{2}, \sqrt{5}, \sqrt{3}$ d. $\sqrt{3}, \sqrt{2}, \sqrt{5}$

Q5. Value of $\sqrt[4]{(81)^{-2}}$ is :

a. $\frac{1}{9}$ b. $\frac{1}{3}$ c. 9 d. $\frac{1}{81}$

Q6. The product $\sqrt[3]{2}.\sqrt[4]{2}.\sqrt[12]{32}$ equals :

a. $\sqrt{2}$ b. 2 c. $\sqrt[12]{2}$ d. $\sqrt[12]{32}$

Q7. Value of $(256)^{0.16} \times (256)^{0.09}$ is :

a. 4 b. 16 c. 64 d. 256.25

Q8. The decimal expansion of the number $\sqrt{2}$ is :

a. a finite decimal b. 1.41421

c. non - terminating recurring d. non-terminating non - recurring

Q9. The number obtained on rationalising the denominator of $\frac{1}{\sqrt{7}-2}$ is :

a. $\frac{\sqrt{7}+2}{3}$ b. $\frac{\sqrt{7}-2}{3}$ c. $\frac{\sqrt{7}+2}{5}$ d. $\frac{\sqrt{7}+2}{45}$

Q10. How many rational numbers are between two rational numbers?

Q11. Is every irrational or rational number a real number?

Q12. Write the value of 1.999... in the form $\frac{p}{q}$, where p, q are integers, $q \neq 0$.

Q13. Write the rationalising factor of $\frac{1}{\sqrt{7}-\sqrt{4}}$.

Q14. Find the value of $(81)^{0.16+0.09}$.

Q15. Find the value of $(256)^{0.16} \times (256)^{0.09}$

Q16. Evaluate: $\left(\frac{1}{2}\right)^5 \times \left(\frac{-2}{3}\right)^4 \times \left(\frac{3}{5}\right)^{-1}$

Q17. Simplify: $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt{4} + \sqrt{225}$

Q18. Simplify: $\frac{1}{(2+\sqrt{5})} + \frac{1}{(\sqrt{5}+\sqrt{6})} + \frac{1}{(\sqrt{6}+\sqrt{7})} + \frac{1}{(\sqrt{7}+\sqrt{8})}$

Q19. Simplify: $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}} - \frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}} - \frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$

Q20. If a = $\frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and b = $\frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$,then find the value of $a^2 + b^2 - 5ab$.

Q21. If $a = 5 + 2\sqrt{6}$ and b = $\frac{1}{a}$ then what will be the value of $a^2 + b^2$

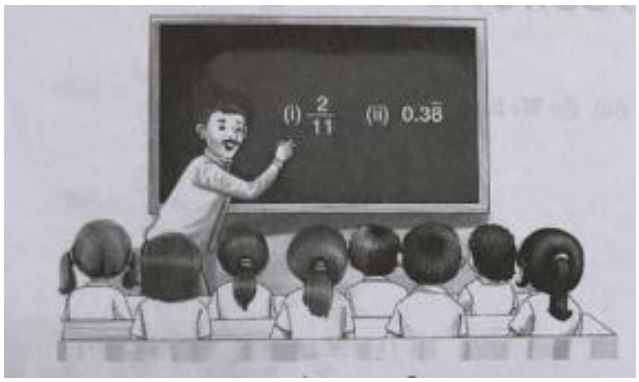
Q22. If a =9 – 4√5, then find the value of a – $\frac{1}{a}$.

Q23. If $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$, find the value of x.

Q24. If x = 2 + √3, find the value of $x^2 + \frac{1}{x^2}$.

Case-study based questions:

Q25. To judge the preparation of students class IX on topic " Number System" Mathematics teachers write two numbers on black board (as shown in figure), and asks some questions about the members, which are following, then answer the question :



i. Write the decimal form of 2/11

a. $0.\overline{81}$ b. $0.\overline{18}$ c. $0.\overline{17}$ d. $0.\overline{71}$

ii. Write the p/q form of $0.3\overline{8}$

a. 5/18 b. 7/18 c. 11/18 d. 1/18

iii. Write the decimal expansion of 2/11

a. Non - terminating b. Terminating

c. Non - terminating repeating d. Non - terminating non - repeating

iv. If p/q form of $0.3\overline{8}$ is m/n, then value of (m + n) is

a. 25 b. 11 c. 29 d. 23

v. The decimal expansion of $0.3\overline{8}$

a. Terminating b. Non-terminating

c. Non-terminating repeating d. Non-terminating non-repeating

CHAPTER - 2 (POLYNOMIALS)

Solve the following questions:

Q1. $\sqrt{2}$ is a polynomial of degree

a. 2 b. 0 c. 1 d. $\frac{1}{2}$

Q2. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p\left(2\sqrt{2}\right)$ is equal to :

a. 0 b. 1 c. $4\sqrt{2}$ d. $8\sqrt{2}+1$

Q3. The value of the polynomial $5x - 4x^2 + 3$, when $x = -1$ is :

a. – 6 b. 6 c. 2 d. –2

Q4. Zero of the polynomial p(x) = 2x + 5 is :

a. $-\frac{2}{5}$ b. $-\frac{5}{2}$ c. $\frac{2}{5}$ d. $\frac{5}{2}$

Q5. If x + 1 is a factor of the polynomial $2x^2 + kx$, then the value of k is :

a. – 3 b. 4 c. 2 d. –2

Q6. x + 1 is a factor of the polynomial :

a. $x^3 + x^2 - x + 1$ b. $x^3 + x^2 + x + 1$ c. $x^4 + x^3 + x^2 + 1$ d. $x^4 + 3x^3 + 3x^2 + x + 1$

Q7. Which of the following is a factor of $(x + y)^3 - (x^3 + y^3)$?

a. $x^2 + y^2 + 2xy$ b. $x^2 + y^2 - xy$ c. xy^2 d. 3xy

Q8. The coefficient of x in the expansion of $(x + 3)^3$ is :

a. 1 b. 9 c. 18 d. 27

Q9. If $\frac{x}{y} + \frac{y}{x} = -1\ (x, y \neq 0)$, the value of $x^3 - y^3$ is :

a. 1 b. –1 c. 0 d. $\frac{1}{2}$

Q10. If $x + y + 2 = 0$, then write the value of $x^3 + y^3 + 8$.

Q11. Write the factors of polynomial $4x^2 + y^2 + 4xy + 8x + 4y + 4$.

Q12. Find the coefficient of x^2 in $(x^2 - 2)^3$.

Q13. Find the value of $249^2 - 248^2$.

Q14. Find the value of 95×96.

Q15. Find the value of the polynomial $p(z) = 3z^2 - 4z + \sqrt{17}$, when $z = 3$.

Q16. If -1 is a zero of the polynomial $p(x) = ax^3 - x^2 + x + 4$, find the value of a.

Q17. Using factor theorem, show that $x-y$ is a factor of $x(y^2 - z^2) + y(z^2 - x^2) + (x^2 - y^2)$.

Q18. Check whether $(p + 1)$ is a factor of $(p^{100} - 1)$ and $(p^{101} - 1)$.

Q19. If $a + b + c = 7$ and $ab + bc + ca = 20$, find the value of $a^2 + b^2 + c^2$.

Q20. Find the product of $(3x + 2y)(3x - 2y)(9x^2 + 4y^2)$.

Q21. If $\left(\frac{8}{15}\right)^3 - \left(\frac{1}{3}\right)^3 - \left(\frac{1}{5}\right)^3 = \frac{x}{75}$, find x.

Q22. Factorise $(x - 3y)^3 + (3y - 7z)^3 + (7z - x)^3$.

Q23. Expand :

a. $\left(\frac{1}{x} + \frac{y}{3}\right)^3$

b. $\left(4 - \frac{1}{3x}\right)^3$

Q24. If $x + \frac{1}{x} = 3$, find the value of $x^2 + \frac{1}{x^2}$ and $x^3 + \frac{1}{x^3}$.

Q25. Determine whether the indicated numbers are zeroes of the given polynomial.

i. $g(x) = 3x^2 - 2; x = \frac{2}{\sqrt{3}}, \frac{-2}{\sqrt{3}}$

ii. $f(x) = x^3 - 6x^2 + 11x - 6$; $x = 1, 3$

Q26. If $p(x) = x^3 + 3x^2 - 2x + 4$, find the value of $p(-2) + p(1) + p(0)$.

Q27. If $x - 2y = 11$ and $xy = 8$, find the value of $x^3 - 8y^3$.

Case-study based questions:

Q28. On one day, principal of a particular school visited the classroom. Class teacher was teaching the concept of polynomial to students. He was very much impressed by her way of teaching. To check, whether the students also understand the concept taught by her or not, he asked various questions to students. Some of them are given below. Answer them.

i. Which one of the following is not a polynomial?

a. $4x^2 + 2x - 1$

b. $y + \left(\frac{3}{y}\right)$

c. $x^3 - 1$

d. $y^2x + 5y + 1$

ii. The polynomial of the type $ax^2 + bx + c$, $a = 0$ is called :

a. Linear polynomial b. Quadratic polynomial

c. Cubic polynomial d. Biquadratic polynomial

iii. If $x + 2$ is the factor of $x^3 - 2ax^2 + 16$, then value of a is :

a. –7 b. 1 c. – 1 d. 7

iv. The value of k, if $(x - 1)$ is a factor of $4x^3 + 3x^2 - 4x + k$, is :

a. 1 b. –2 c. –3 d. 3

v. The number of zeroes of the polynomial $x^2 + 4x + 2$ is :

a. 1 b. 2 c. 3 d. 4

CHAPTER - 3 (COORDINATE GEOMETRY)

Solve the following questions:

Q1. Abscissa of all points on the x - axis is :

a. 0 b. 1 c. –1 d. none of these

Q2. A point both of whose coordinates are negative lies in the :

a. first quadrant b. second quadrant

c. third quadrant d. fourth quadrant

Q3. Which of the points P (0, 3), Q (1, 0), R (0, –1) and S(–5, 0), T (1, 2) do not lie on the x - axis?

a. P and Q only b. Q and S c. P, R and T d. Q, S and T

Q4. The coordinates of the point lying on the negative side of x - axis at a distance of 5 units from the origin are :

a. (0, 5) b. (0, –5) c. (5, 0) d. (–5, 0)

Q5. If the coordinates of two points are P(–2, 3) and Q (–3, 5), then (abscissa of P)–(abscissa of Q) is :

a. 1 b. –1 c. –2 d. –5

Q6. Signs of the abscissa and the ordinate of a point in the second quadrant are respectively :

a. +ve, +ve b. –ve, –ve c. –ve, +ve d. +ve, –ve

Q7. Ordinate of all points on the x - axis is :

a. 0 b. 1 c. 2 d. –1

Q8. The distance of the point (4, –3) from x - axis is :

a. – 3 units b. 4 units c. 3 units d. 5 units

Q9. The point at which the two coordinate axes meet is called the :

a. abscissa b. origin c. ordinate d. quadrant

Q10. Points (1, –1), (2, –2), (4, –5), (–3, –4)

a. lie in II quadrant b. lie in III quadrant

c. lie in IV quadrant d. do not lie in the same quadrant

Q11. Write the abscissa of the point (–2, 7).

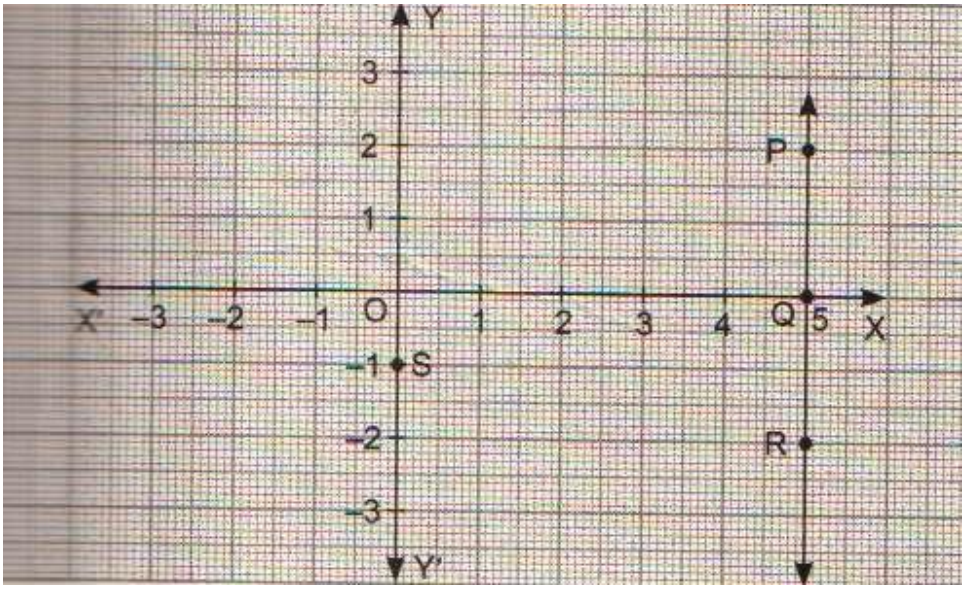
Q12. Write the co-ordinates of a point whose ordinate is –3 and which lies on y-axis.

Q13. Find ordinate of all points on the x-axis.

Q14. Find the perpendicular distance of point P(3, 4) from x-axis.

Q15. If the points A(0, 2), B(0, –6) and C(a, 3) lie on y-axis, then find the value of a.

Q16. In the figure given below, PQ is a line parallel to the y-axis at a distance of 5 units from it. What are the coordinates of the points P, Q, R and S?



Q17. Write the co-ordinates of the point :

i. Whose ordinate is –5 and which lies on y-axis?

ii. Which lies on x and y axes both?

iii. Whose abscissa is –3 and which lies on x-axis?

Q18. Name the quadrants in which the following points lie:

(-5, -4), (2, -4), (-7, 6), (2, 3)

Q19. Which of the following points lie on x-axis? Which on y-axis?

A(0, 2), B(5, 6), C(-3, 0), D(0, -3), E(0, 4), F(6, 0), G(3, 0)

Q20. If x > 0 and y > 0, then the point (x, y) lies in which quadrants?

Q21. In which quadrants or on which axis do each of the points (4, -2), (-3, 7), (-1, -2), (3. 6) lie?

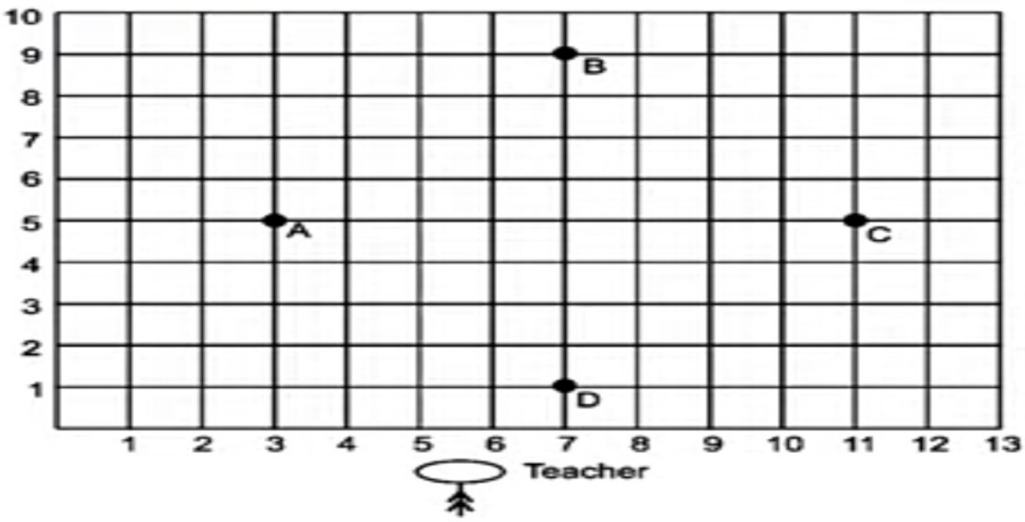
Q22. If a point is on negative side of y-axis at a distance of 3 units from origin, then the coordinates of the point.

Q23. Find the perpendicular distance of the point P(3, 4) from x-axis.

Q24. Find the coordinates of the point which lies on y-axis at a distance of 4 units in the negative direction of y-axis.

Case-study based questions:

Q25. Students of a school are standing in rows and columns in their playground for a drill practice. A, B, C and D are the positions of four students as shown in the figure.



i. What is coordinate of A?

a. (3, 5) b. (5, 3) c. (7, 8) d. (9, 7)

ii. What is the coordinate of B?

a. (7, 8) b. (8, 7) c. (7, 9) d. (9, 7)

iii. What is the coordinate of C?

a. (11, 5) b. (5, 11) c. (8, 11) d. (–11, 5)

iv. What is the coordinate of D?

a. (7, 1) b. (1, 7) c. (–7, 1) d. (–1, 7)

v. What are the coordinates of the point of intersection of AC and BD?

a. (7, 5) b. (5, 7) c. (7, 7) d. (5, 5)

CHAPTER - 4 (LINEAR EQUATIONS IN TWO VARIABLES)

Solve the following questions:

Q1. A linear equation in two variables is of the form ax + by + c = 0, where:

a. $a^2 + b^2 \neq 0$ b. $a = 0, b \neq 0$ c. $a \neq 0, b = 0$ d. $a = 0, c = 0$

Q2. The solution of a linear equation in two variables is:

a. a number which satisfies the given equation

b. an ordered pair which satisfies the given equation

c. an ordered pair whose two components are equal

d. none of these

Q3. If (2, 0) is a solution of the linear equation 2x + 3y = k, then the value of k is :

a. –4 b. 6 c. 5 d. 4

Q4. The linear equation 3x – 11y = 10 has:

a. unique solution b. two solutions

c. infinitely many solutions d. no solutions

Q5. The solution of equation x – 2y = 4 is:

a. (0, 2) b. (2, 0) c. (4, 0) d. (1, 1)

Q6. The equation 2x + 5y = 7 has a unique solution, if x, y are :

a. natural numbers b. positive real numbers

c. real numbers d. rational numbers

Q7. The equation x = 7, in two variables, can be written as :

a. 1.x + 1.y = 7 b. 1.x + 0.y = 7 c. 0.x + 1.y = 7 d. 0.x + 0.y = 7

Q8. If a linear equation has solutions (–2, 2), (0, 0) and (2, –2), then it is of the form

a. y – x = 0 b. x + y= 0 c. –2x + y = 0 d. –x + 2y = 0

Q9. Any point on the x-axis is of the form :

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

Q10. x = 5, y = 2 is a solution of the linear equation :

a. x + 2y = 7 b. 5x + 2y = 7 c. x + y = 7 d. 5x + y = 7

Q11. Write the equation 2x = 9, in the standard form of a linear equation in two variables.

Q12. Compare the equations $\frac{x}{3}+\frac{3}{2}y+4=2y-3$ and lx + my – n = 0 and write the value of l, m and n.

Q13. How many solution(s) does the equation y = 5x + 2 have?

Q14. Write a linear equation in two variables whose one solution is given by the point (a, b).

Q15. Find the value of x for the linear equation $2\sqrt{2}x-3y+4=0$ corresponding to y = 2.

Q16. Write a linear equation for the statement "Twice a number decreased by 7 gives 69". Also, find one solution. How many solutions does the equation have?

Q17. Show that x = 1, y = 4 satisfy the linear equation 2x + y – 6 = 0.

Q18. If x = 2√2 and y = √2 satisfy the linear equation 3x + ky = 4√2, find the value of k. Can there be more than one value of k?

Q19. If $\left(\frac{x}{3}\right)+2y=5$ express x in terms of y. Also, check whether x = 3, y = 2 is the solution of this equation or not?

Q20. Write any four solutions for the following linear equation ax – by = 2ab.

Q21. Check whether equations (i) $\sqrt{x}+\frac{1}{\sqrt{x}}=3$ (ii) √2x + √3y = 0 are linear.

Case-study based questions:

Q22. Charity is the act of giving help to those in need it. It is a humanitarian act. So in this order, Radha distributed chocolates in an orphanage, on her birthday, she gave 5 chocolates to each child and 20 chocolates to adults. Taking number of children as x and total chocolates distributed as y.

i. Write a linear equation, in standard form as ax + by + c = 0.

a. 20x – y + 5 = 0 b. 5x - y + 20 = 0

c. x – 20y + 5 = 0 c. 20x – y + 10 = 0

ii. Value of (a + b + c) is :

a. 24 b. 26 c. 14 d. 30

iii. If the number of children is 18, then the number of distributed chocolates are :

a. 90 b. 100 c. 110 d. 120

iv. If she distributed 205 chocolates, then how many children are there in the orphanage?

a. 36 b. 37 c. 39 d. 41

v. If she gave 8 chocolates to each child and 28 chocolates as x and total chocolates distributed as y, then form a linear equation :

a. y = 5x + 28 b. 8y = x + 20 c. y = 8x +28 d. y = 8x - 20

CHAPTER - 5 (INTRODUCTION TO EUCLID'S GEOMETRY)

Solve the following questions:

Q1. The three from solids to points are :

a. Solids - surfaces - lines - points b. Solids - lines - surfaces - points

c. Lines - points - surfaces - solids d. Lines - points - surfaces - solids

Q2. Euclid stated that all right angles are equal to each other in the form of :

a. an axiom b. a definition c. a postulate d. a proof

Q3. 'Lines are parallel if they do not intersect' is stated in the form of :

a. an axiom b. a definition c. a postulate d. a proof

Q4. Which of the following needs a proof?

a. Theorem b. Axiom c. Definition d. Postulate

Q5. A pyramid is a solid figure, the base of which is :

a. only a triangle b. only a square c. only a rectangle d. any polygon

Q6. It is known that if x + y = 10, then x + y + z = 10 + z. The Euclid's axiom that illustrates this statement is :

a. First Axiom b. Second Axiom c. Third Axiom d. Fourth Axiom

Q7. In Indus Valley Civilisation (about 3000 B.C.), the bricks used for construction work were having dimensions in the ratio :

a. 1 : 3 : 4 b. 4 : 2 : 1 c. 4 :4 : 1 d. 4 : 3 : 2

Q8. Euclid divided his famous treatise "The Elements" into :

a. 13 chapters b. 12 chapters c. 11 chapters d. 9 chapters

Q9. Euclid belongs to the country :

a. Babylonia b. Egypt c. Greece d. India

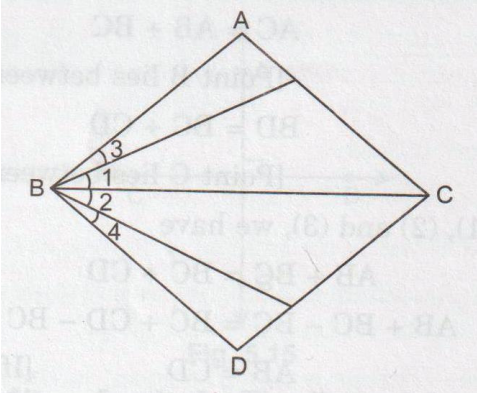
Q10. How many lines do pass through two distinct points?

Q11. How many lines can pass through a given point?

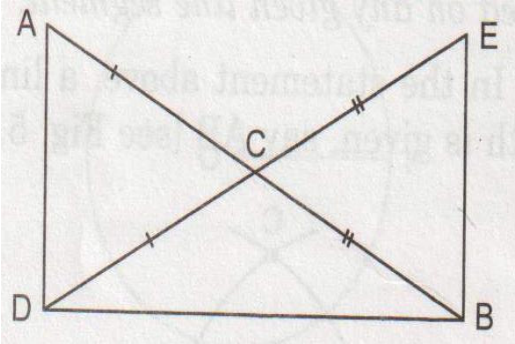
Q12. How many line segments can be determined by three collinear points?

Q13. Define parallel lines.

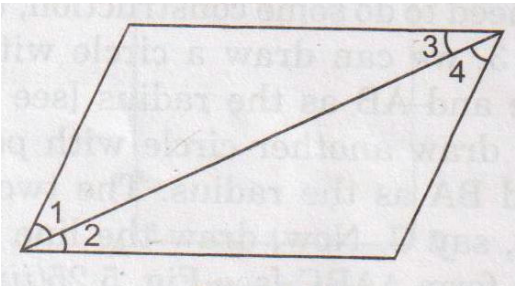
Q14. In figure, we have $\angle 1 = \angle 2, \angle 3 = \angle 4$. Show that $\angle ABC = \angle DBC$. State the Euclid's axiom used.



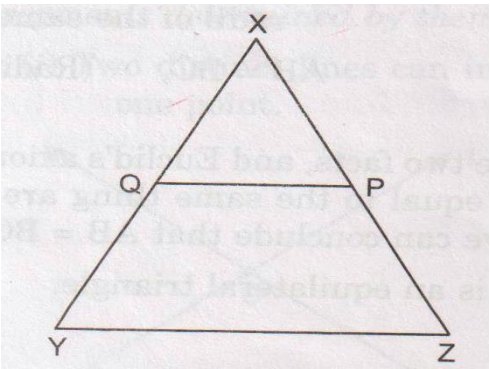
Q15. In figure, AC = DC, CB = CE. Show that AB =DE. Write Euclid's axiom to support this.



Q16. In figure, if $\angle 1 = \angle 3, \angle 2 = \angle 4$ and $\angle 3 = \angle 4$, write the relation between $\angle 1$ and $\angle 2$, by using an Euclid's axiom. Write the axiom.



Q17. In figure, if QX = $\frac{1}{2}$XY, PX = $\frac{1}{2}$ XZ and QX = PX, show that XY = XZ.



Q18. Solve the equation x – 15 = 25 and state Euclid's axiom used here.

CHAPTER - 6 (LINES AND ANGLES)

Solve the following questions:

Q1. If two angles are complements of each other then each angle is :

a. an acute angle b. a right angle c. a reflex angle d. an obtuse angle

Q2. An angle which measures more than 180^0 but less than 360^0, is called :

a. an acute angle b. a reflex angle c. an obtuse angle d. a straight angle

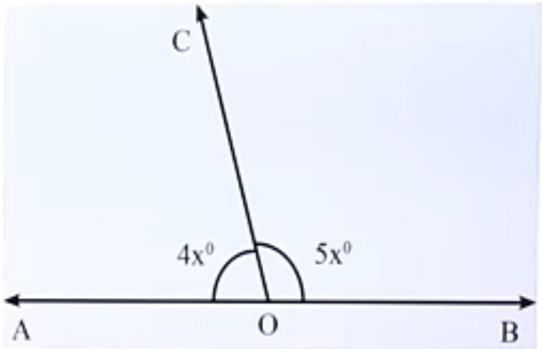
Q3. The measure of an angle is five times its complement. The angle measures :

a. 25^0 b. 35^0 c. 65^0 d. 75^0

Q4. Two complementary angles are such that twice the measure of the one is equal to three times the measure of the other. The larger of the two measures :

a. 72^0 b. 54^0 c. 63^0 d. 36^0

Q5. In the given figure, AOB is a straight line. If $\angle AOC = 4x^0$ and $\angle BOC = 5x^0$ then $\angle AOC = ?$



a. 40^0 b. 60^0 c. 80^0 d. 100^0

Q6. Which of the following statements is false?

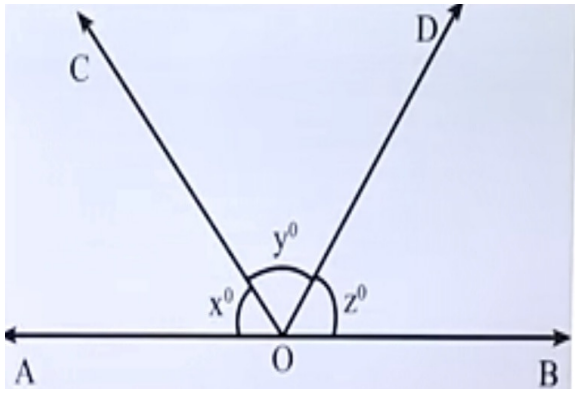
a. Through a given point, only one straight line can be drawn.

b. Through two given points, it is possible to draw one and only one straight line.

c. Two straight lines can intersect only at one point.

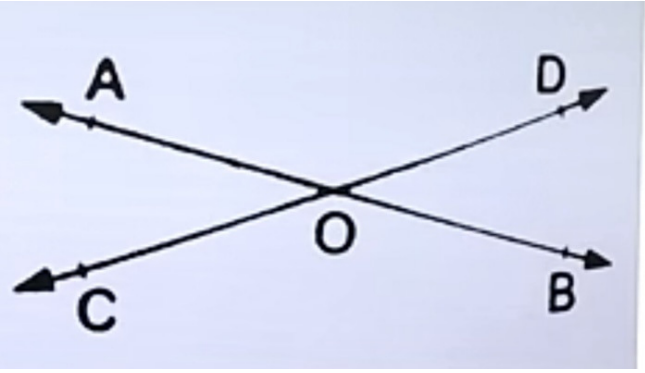
d. A line segment can be produced to any desired length.

Q7. In the adjoining figure, AOB is a straight line. If x : y : z = 4 : 5 : 6, then y = ?



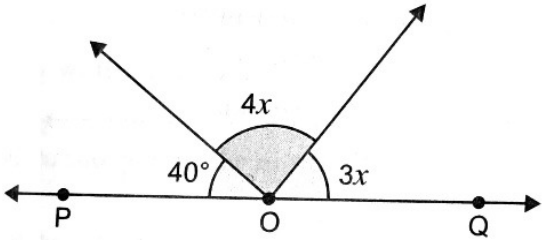
a. 60^0 b. 80^0 c. 48^0 d. 72^0

Q8. In the given figure, straight lines AB and CD intersect at O. If $\angle AOC + \angle BOD = 130^0$ then $\angle AOD = ?$



a. 65^0 b. 115^0 c. 110^0 d. 125^0

Q9. In figure, POQ is a line. The value of x is :



a. 20^0 b. 25^0 c. 30^0 d. 35^0

Q10. An angle is one fifth of its supplement. The measure of the angle is :

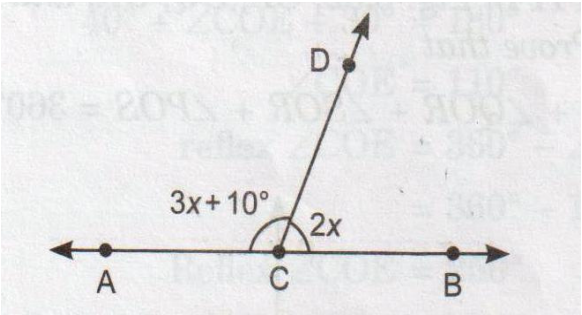
a. 15^0 b. 30^0 c. 75^0 d. 150^0

Q11. Find the angle which exceeds it complementary angle by 30^0.

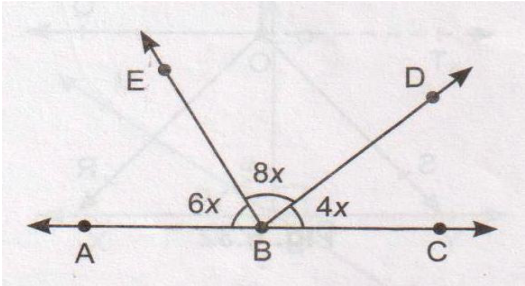
Q12. Two supplementary angles are in the ratio 2:7. Find the measure of angles.

Q13. If an angle is 14^0 more than its complement, then find its measure.

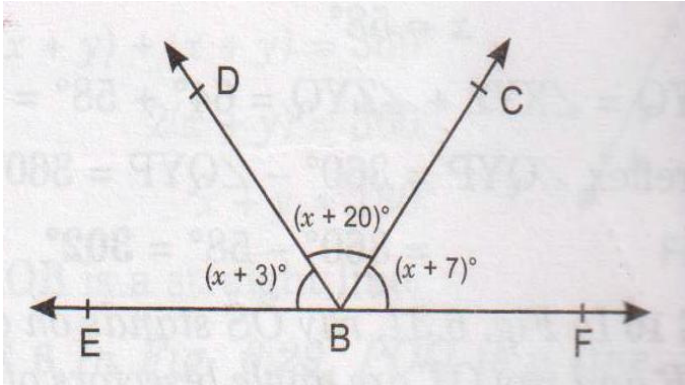
Q14. In figure, ACB is a line. If $\angle DCA = 3x + 10^0$ and $\angle DCB = 2x$, then find the value of x.



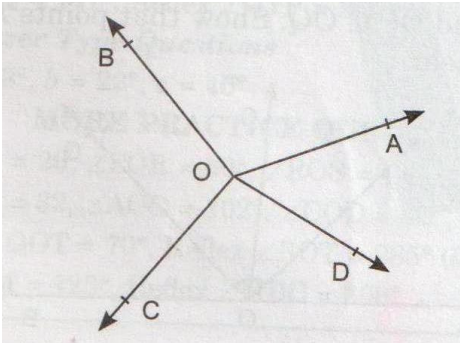
Q15. In figure, find the measure of $\angle DBC$:



Q16. In figure, find the value of x.

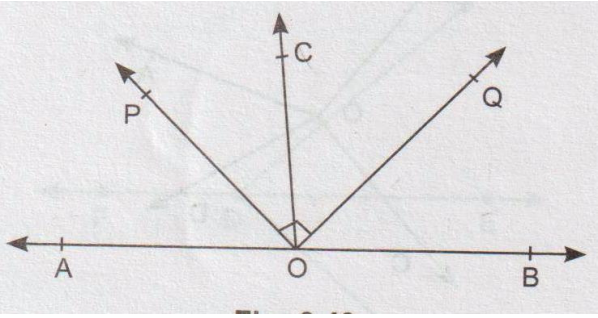


Q17. In figure, prove that $\angle AOB + \angle BOC + \angle COD + \angle DOA = 360^0$.

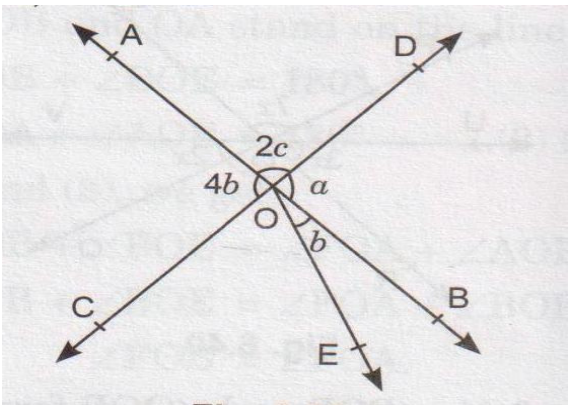


Q18. "If two lines intersect each other, then the vertically opposite angles so formed are equal." Prove it.

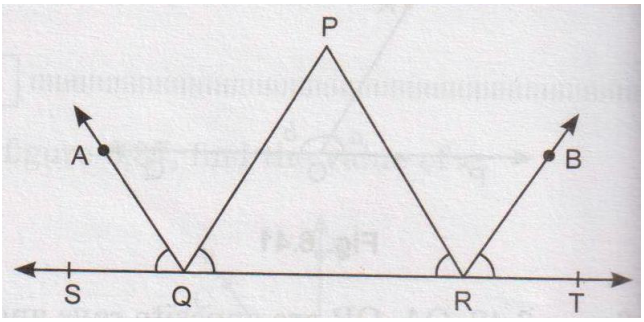
Q19. In the figure, OP bisects $\angle AOC, OQ$ bisects $\angle BOC$ and $OP \perp OQ$. Show that points A, O and B are collinear.



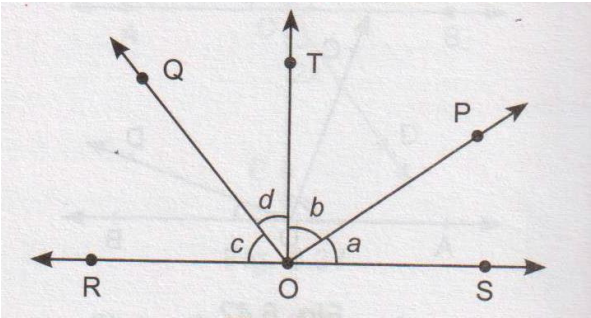
Q20. In the figure, two straight lines AB and CD intersect each other at O. If $\angle COE = 70^0$, find the values of a, b and c.



Q21. In figure, QA and RB are the bisectors of $\angle PQS$ and $\angle PRT$ respectively, and $\angle SQA = \angle TRB$. Prove that $\angle PQR = \angle PRQ$.



Q22. In figure a + b = c + d, then prove that $\angle ROT = 90^0$.



CHAPTER - 7 (TRIANGLES)

Solve the following questions:

Q1. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is :

a. an isosceles triangle b. an obtuse angled triangle

c. an equilateral triangle d. a right angled triangle

Q2. It is given that $\Delta ABC \cong \Delta FDE$ and AB = 5cm, $\angle B = 40^0$ and $\angle A = 80^0$. Then which of the following is true?

a. DF = 5cm, $\angle F = 60^0$ b. DF = 5cm, $\angle E = 60^0$

c. DE = 5cm, $\angle E = 60^0$ d. DE = 5cm, $\angle D = 40^0$

Q3. If the bisector of the angle A of a ΔABC is perpendicular to the base BC of the triangle then the triangle ABC is :

a. Scalene b. Obtuse angled c. Equilateral d. Isosceles

Q4. In quadrilateral ABCD, BM and DN are drawn perpendiculars to AC such that BM = DN. If BR = 8cm, then BD is :

a. 4cm b. 12 cm c. 16 cm d. 2 cm

Q5. In ΔABC and ΔPQR, three equality relations between corresponding parts are as follows :

AB = QP, $\angle B = \angle P$, BC = PR. State which of the congruence criterion applies in this case :

a. SAS b. ASA c. SSS d. AAS

Q6. D, E and F are the mid - points of sides BC, CA and AB respectively of ΔABC. Then ΔDEF is congruent to triangle :

a. ABC b. AEF c. BFD, CDE d. AFE, BFD, CDE

Q7. If $\Delta ABC \cong \Delta PQR$ and ΔABC is not congruent to ΔRPQ, then which of the following is not true?

a. BC = PQ b. AC = PR c. QR = BC d. AB = PQ

Q8. In ΔABC, AB = AC and $\angle B = 50^0$, then $\angle C =$

a. 40^0 b. 50^0 c. 80^0 d. 130^0

Q9. In triangles ABC and PQR, AB =AC, $\angle C = \angle P$ and $\angle B = \angle Q$. The two triangles are :

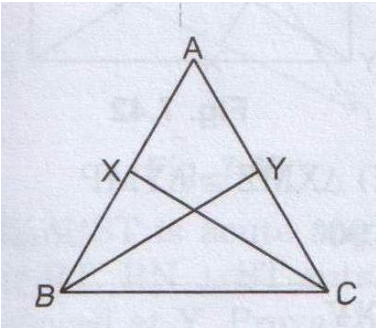
a. isosceles but not congruent b. isosceles and congruent

c. congruent but not isosceles d. neither congruent nor isosceles

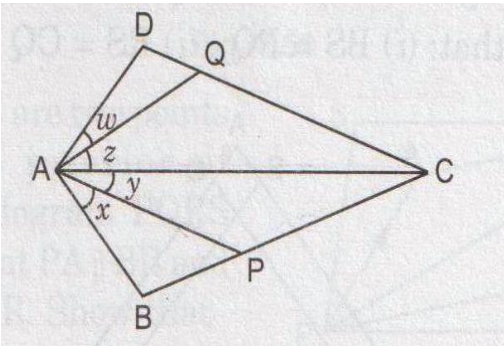
Q10. In ΔABC and ΔDEF, If AB = DE, $\angle A = \angle D$ and AC = DF, then write the criterion of congruency condition.

Q11. In $\Delta PQR, \angle R = \angle P$ and PR – PQ = 3cm. If the perimeter of ΔPQR is 15cm, then find PR.

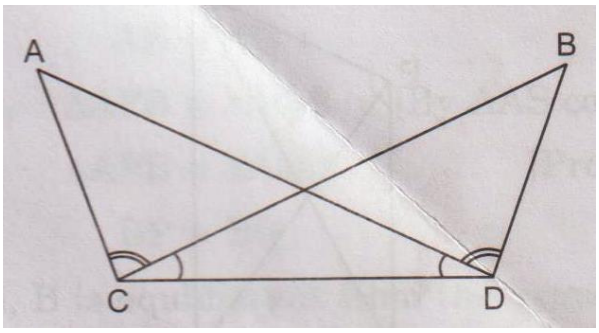
Q12. In the figure, ABC is a triangle in which AB = AC. X and Y are points on AB and AC such that AX = AY. Prove that $\Delta ABY \cong \Delta ACX$.



Q13. In the figure, if AB = AD, $\angle x = \angle \omega$ and $\angle y = \angle z$, then prove that AP = AQ.



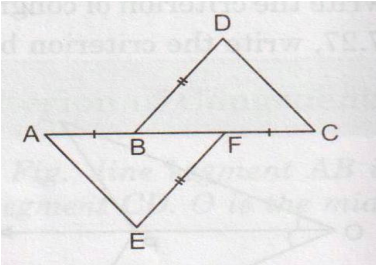
Q14. In the figure, $\angle BCD = \angle ADC$ and $\angle ACB = \angle BDA$. Prove that AD = BC and $\angle A = \angle B$.



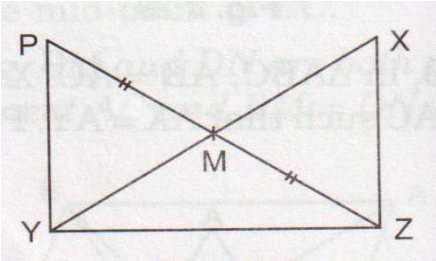
Q15. In the figure, AB = CF, EF = BD and $\angle AFE = \angle CBD$, prove that

i. $\Delta AFE \cong \Delta CBD$ and

ii. AE = CD



Q16. In a right angled triangle XYZ right angled at Z, M is the mid - point of XY. Z is joined to M and produced to a point P such that PM = ZM. Point P is joined to point Y.



Show that :

i. $\Delta XMZ \cong \Delta YMP$ ii. $\angle PYZ = 90^0$ iii. $\Delta PYZ \cong \Delta XZY$ iv. $ZM = \frac{1}{2}XY$

CHAPTER - 8 (QUADRILATERALS)

Solve the following questions:

Q1. Three angles of a quadrilateral are 75^0, 90^0 and 75^0. The fourth angle is :

a. 90^0 b. 95^0 c. 105^0 d. 120^0

Q2. A diagonal of a rectangle is inclined to one side of the rectangle at 25^0. The acute angle between the diagonals is :

a. 55^0 b. 50^0 c. 40^0 d. 25^0

Q3. 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

Q4. The quadrilateral formed by joining the mid - points of the sides of a quadrilateral PQRS, taken in order, is a rectangle, if :

a. PQRS is a rectangle b. PQRS

c. diagonals of PQRS are perpendicular d. diagonals of PQRS are equal

Q5. If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD intersect each other at P, $\angle B$ and $\angle C$ at Q, $\angle C$ and $\angle D$ and $\angle A$ at S, then PQRS is a

a. rectangle

b. rhombus

c. parallelogram

d. quadrilateral whose opposite angles are supplementary

Q6. D and E are the mid - points of the sides AB and AC of ΔABC and O is any point on side BC. O is joined respectively, the DEQP is :

a. a square b. a rectangle c. a rhombus d. a parallelogram

Q7. The figure formed by joining the mid-points of the sides of a quadrilateral ABCD, taken in order, is a square only if,

a. ABCD is a rhombus

b. diagonals of ABCD are equal

c. diagonals of ABCD are equal and perpendicular

d. diagonals of ABCD are perpendicular

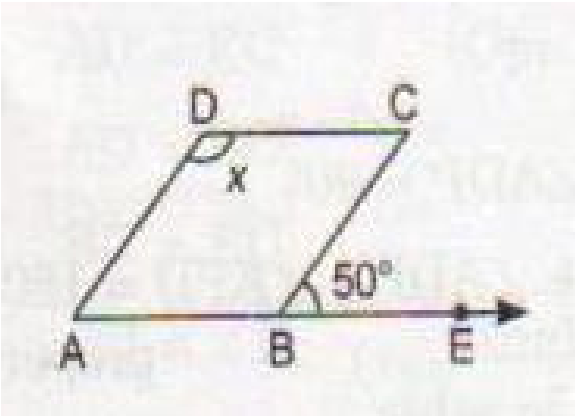
Q8. The diagonals AC and BD of a parallelogram ABCD intersect each other at the point O. If $\angle DAC = 32^0$ and $\angle AOB = 70^0$, then $\angle DBC$ is equal to :

a. 24^0 b. 86^0 c. 38^0 d. 32^0

Q9. D and E are the mid-points of the sides AB and AC respectively of ΔABC. DE is produced to F. To prove that CF is equal and parallel to DA, we need an additional information which is :

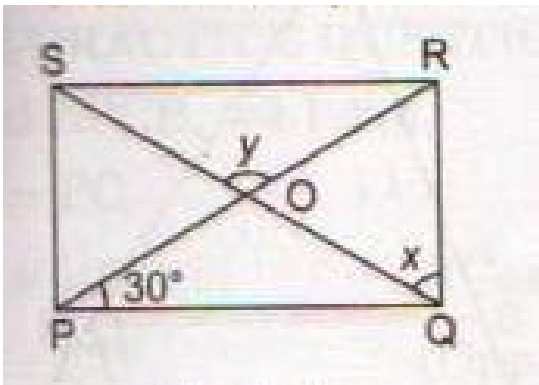
a. $\angle DAE = \angle EFC$ b. AE = EF c. DE = EF d. $\angle ADE = \angle ECF$

Q10. In the given figure, ABCD is a parallelogram in which $\angle CBE = 50^0$. What is the value of x?



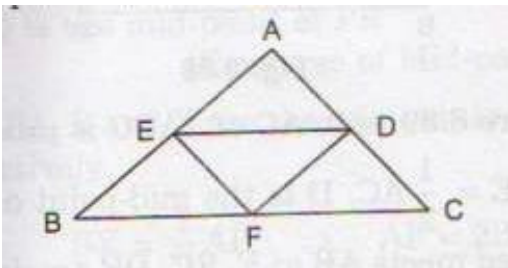
Q11. Two consecutive angles of a parallelogram are in the ratio 1:3, then find the smaller angle.

Q12. In figure, PQRS is a rectangle. If $\angle RPQ = 30^0$, then find the value of (x +y).



Q13. If PQRS is a parallelogram, then find $\angle Q - \angle S$.

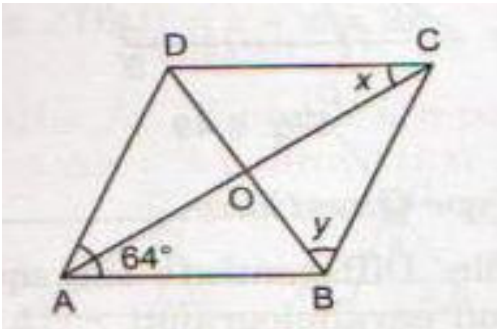
Q14. In the figure points D, E and F are the mid-points of the sides AC, AB and BC of ΔABC. If AB = 4.2cm, BC = 5.6cm and AC = 3.6 cm, then find the perimeter of ΔDEF .



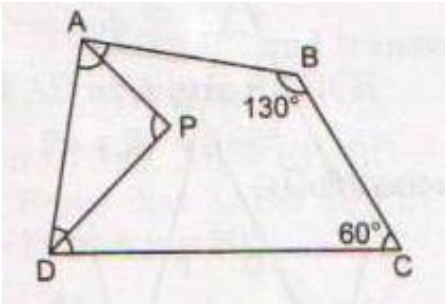
Q15. The perimeter of a parallelogram is 36cm. If the smaller side is 8cm long. Find the measure of its longer side.

Q16. Two opposite angles of a parallelogram are $(3x - 2)^0$ and $(63-2x)^0$. Find all the angles of the parallelogram.

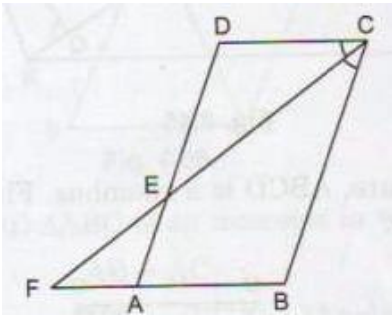
Q17. In the figure, ABCD is a rhombus. Find the value of x and y.



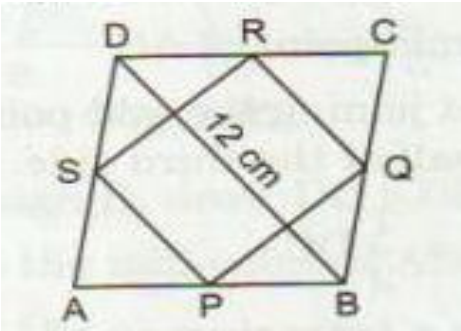
Q18. In figure, ABCD is a quadrilateral in which $\angle B = 130^0, \angle C = 60^0$ and angle bisectors of $\angle A$ and $\angle D$ meet at P. Find $\angle APD$.



Q19. In parallelogram ABCD of the given figure, the bisector $\angle C$ meets AD at E. CE and BA are produced to meet at F. Prove that BC = BF.



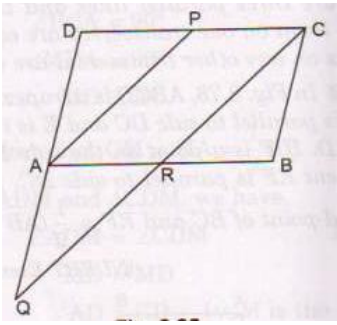
Q20. In Figure, ABCD is a quadrilateral and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. If BD = 12cm, then find (QR + SP).



Q21. ABCD is a parallelogram and P is the mid-point of DC. A line through C drawn parallel to PA meets produced DA at Q and AB at R. Prove that

i. DA = AQ

ii. CR = QR



Case-study based questions:

Q22. Geoboard : During maths lab activity each students was given a opportunity to show up his/her creation on a geoboard using rubber bands. When students were demonstrating their works, teacher ashed some questions. What would be your answer, if you were the class?

i. A quadrilateral with all sides equal was formed. It could be a :

a. trapezium b. parallelogram

c. kite d. rhombus

ii. A quadrilateral with unequal diagonals but perpendicular was formed. Its special name might be :

a. a kite b. a square c. both a and b d. a rectangle

iii. A rectangle formed by joining the mid-points of a quadrilateral?

a. a rectangle b. a rhombus c. a parallelogram d. none of these

iv. A quadrilateral was formed with one pair of parallel sides and non-parallel sides equal. Which of the following can be its feature?

a. Its diagonals are equal

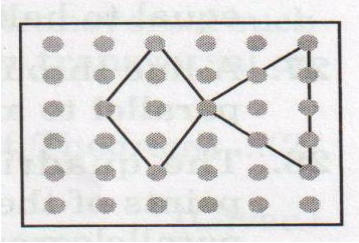
b. opposite angles are supplementary

c. It can be split up into two shapes a parallelogram and an isosceles triangle.

d. All of above

v. A quadrilateral having equal and mutually perpendicular diagonals was formed. It was a :

a. square b. rectangle c. rhombus d. kite



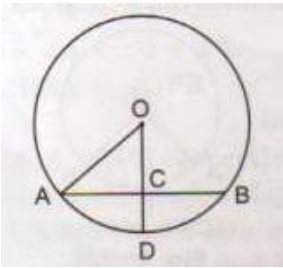
CHAPTER - 10 (CIRCLES)

Solve the following questions:

Q1. AD is a diameter of a circle and AB is a chord. If AD = 34 cm, AB = 30 cm, the distance of AB from the center of the circle is :

a. 17cm b. 15 cm c. 4 cm d. 8 cm

Q2. In figure, if OA = 5cm, AB = 8cm and OD is perpendicular to AB, then CD is equal to :

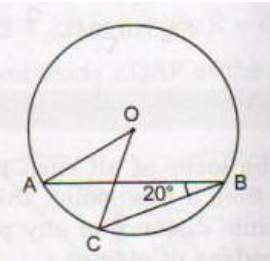


a. 2cm b. 3 cm c. 4 cm d. 5 cm

Q3. If AB = 12cm, BC = 16 cm and AB is perpendicular to BC, then the radius of the circle passing through the points A, B and C is :

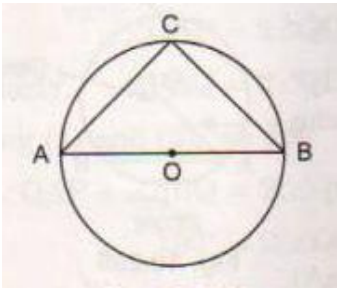
a. 6 cm b. 8 cm c. 10 cm d. 12 cm

Q4. In figure, if $\angle ABC = 20^0$, then $\angle AOC$ is equal to :



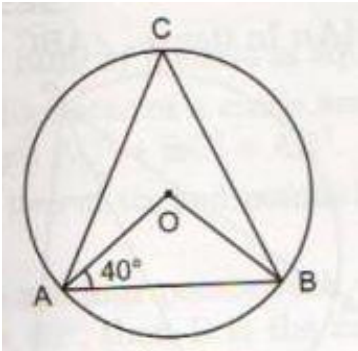
a. 20^0 b. 40^0 c. 60^0 d. 10^0

Q5. In figure, if AOB is a diameter of the circle and AC = BC, then $\angle CAB$ is equal to :



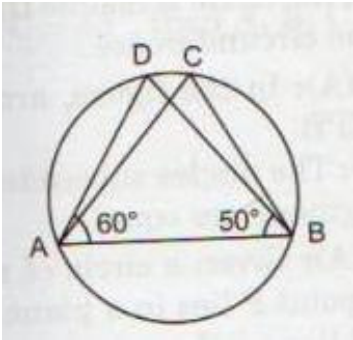
a. 30^0 b. 60^0 c. 90^0 d. 45^0

Q6. In Figure if $\angle OAB = 40^0$, then $\angle ACB$ is equal to :



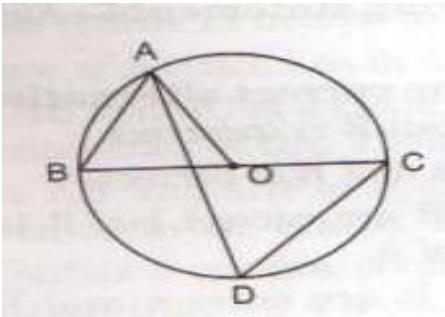
a. 50^0 b. 40^0 c. 60^0 d. 70^0

Q7. In figure, if $\angle DAB = 60^0$, $\angle ABD = 50^0$, then $\angle ACB$ is equal to :



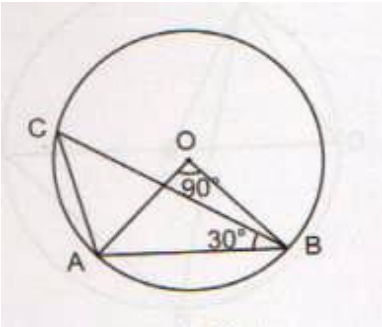
a. 60^0 b. 50^0 c. 70^0 d. 80^0

Q8. In figure, BC is a diameter of the circle and $\angle BAO = 60^0$. Then $\angle ADC$ is equal to :



a. 30^0 b. 45^0 c. 60^0 d. 120^0

Q9. In figure, $\angle AOB = 90^0$ and $\angle ABC = 30^0$, then $\angle CAO$ is equal to :

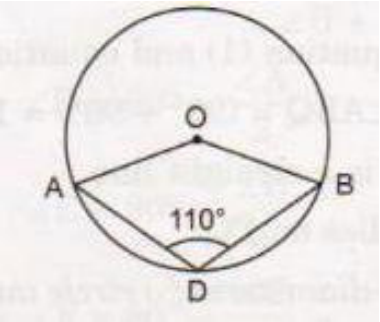


a. 30^0 b. 45^0 c. 90^0 d. 60^0

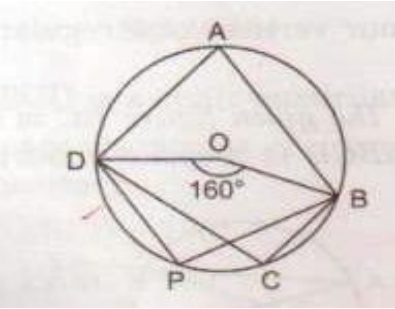
Q10. Chord AB Subtends $\angle AOB = 60^0$ at the center of a circle. If OA = 5cm, find the length of AB in cm.

Q11. Find the length of the chord, which is at a distance of 3cm from the center of a circle of radius 5cm.

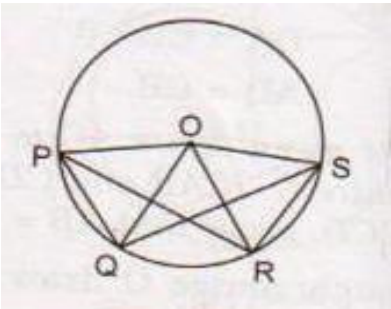
Q12. In the figure, O is the center of the circle passing through A, D and B. If $\angle ADB = 110^0$, find the measure of $\angle AOB$, corresponding to arc ADB.



Q13. In figure, ABCD is a cyclic quadrilateral and O is the center of the circle. If $\angle BOD = 160^0$, then find $\angle BCD$.

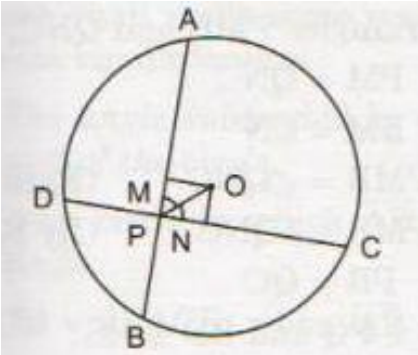


Q14. In the given figure, O is the center of a circle passing through points P, Q, R and S. If PQ = RS, prove that PR = QS.

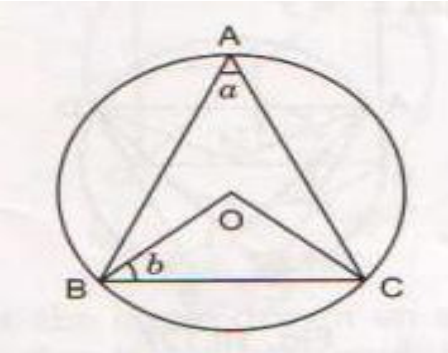


Q15. Two circles of radii 10 cm and 8cm intersect and the length of the common chord is 12cm. Find the distance between their centers.

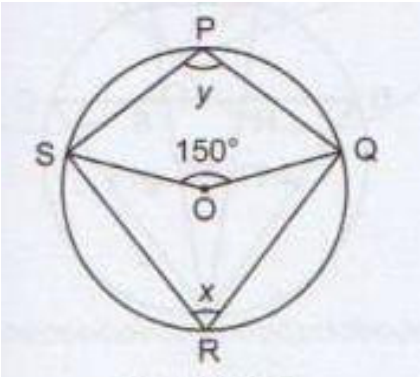
Q16. In figure, AB and CD are two chords of a circle whose center is O. If $OM \perp AB$, $ON \perp CD$ and $\angle OPM = \angle OPN$, prove that MB = ND.



Q17. In figure, O is the center of a circle, BC is its chord and A is any point on the circle. If $\angle BAC = a$ and $\angle OBC = b$, find a + b.

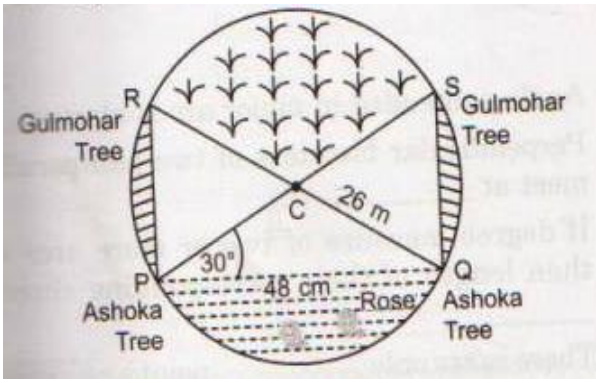


Q18. In figure, O is the center of the circle passing through P, Q, R and S. If $\angle SOQ = 150^0$, find the values of x and y.



Case-study based questions:

Q19. There is a circular park of radius 26m. Four trees (2 Ashoka and 2 Gulmohar) are on the boundary of the park, an shown by points P, Q and R, S respectively. Let C be the centre of the park. There are few flower beds developed in different parts of the park.



i. Which shops resemble the tulip area?

a. a segment b. a sector c. a semicircle d. a quadrant

ii. Two Ashoka trees are 48 apart from each other. From C, the line joining PQ is at a distance of :

a. 5m b. 10 m c. 12 m d. 15m

iii. If PS is a diameter then measure of $\angle PQS$ =

a. 90^0 b. 60^0 c. 120^0 d. 105^0

iv. If $\angle QPS = 30^0$ and Q, C, R are collinear then measure of $\angle PRQ =$

a. 60^0 b. 45^0 c. 75^0 d. 90^0

v. Which of the following is not true?

a. $\angle RQS = \angle RPS$ b. $\angle PSQ = \frac{1}{2}\angle PCQ$

c. PR = QS d. None of these

CHAPTER - 12 (HERON'S FORMULA)

Solve the following questions:

Q1. In ΔABC, AB = 6 cm, BC = 7 cm and AC = 5 cm. The area of ΔABC is :

a. $6\sqrt{6}\,cm^2$ b. $6\sqrt{3}\,cm^2$ c. $6\sqrt{2}\,cm^2$ d. $9\sqrt{6}\,cm^2$

Q2. The sides of a triangle are in the ratio 25 : 14 : 12 and its perimeter is 510m. The greatest side of the triangle is :

a. 120m b. 170m c. 270m d. 250m

Q3. The perimeter of an equilateral triangle is 60m. The area is :

a. $10\sqrt{3}$ m² b. $15\sqrt{3}$ m² c. $20\sqrt{3}$ m² d. $100\sqrt{3}$ m²

Q4. The sides of a triangle are 35cm, 54cm and 61cm. The length of its longest altitude is :

a. $16\sqrt{5}$ cm b. $10\sqrt{5}$ cm c. $24\sqrt{5}$ cm d. 28 cm

Q5. The area of an isosceles triangle having base 2 cm and length of one of the equal sides 4cm, is :

a. $\sqrt{15}$ cm² b. $2\sqrt{15}$ cm² c. $\sqrt{\frac{15}{2}}$ cm² d. $4\sqrt{15}$ cm²

Q6. The base of an isosceles right triangle is 30cm. Its area is :

a. 225 cm² b. $225\sqrt{3}$ cm² c. $225\sqrt{2}$ cm² d. 450 cm²

Q7. An isosceles right triangle has area 8 cm². The length of its hypotenuse is :

a. $\sqrt{32}\,cm$ b. 4 cm c. $4\sqrt{3}\,cm$ d. $2\sqrt{6}\,cm$

Q8. The base of a right triangle is 8 cm and hypotenuse is 10cm. Its area is equal to :

a. 48 cm² b. 40 cm² c. 24 cm² d. 80 cm²

Q9. The edges of a triangular board are 6 cm, 8 cm and 10 cm. The cost of painting it at the rate of 9 paise per square centimeter is :

a. Rs. 2.00 b. Rs. 2.16 c. Rs. 4.32 d. Rs. 2.70

Q10. If the area of an equilateral triangle is $16\sqrt{3}$ cm², then the perimeter of the triangle is :

a. 48 cm b. 24 cm c. 12 cm d. 36 cm

Q11. If the area of an equilateral triangle is $16\sqrt{3}$ cm², then find the perimeter of the triangle.

Q12. The base of a right triangle is 8 cm and hypotenuse is 10cm. Find its area.

Q13. If the perimeter of an equilateral triangle is 60cm, then find its area.

Q14. The difference of semi-perimeter and the sides of a ΔABC are 8cm, 7 cm and 5cm respectively. Find the semi - perimeter of ΔABC.

Q15. The semi-perimeter of a triangle is 132 cm. The product of the difference of semi-perimeter and its respectively sides is 13200 cm^3. Find the area of the triangle.

Q16. The perimeter of a triangle is 300 cm and its sides are in the ratio 5 : 12 : 13. Find its area.

Q17. Find the area of an isosceles triangle whose one side is 10 cm greater than its each equal side and its perimeter is 100 cm. (Take $\sqrt{5} = 2.236$)

Q18. Find the percentage increase in the area of a triangle if its each side is doubled.

Q19. The cost of levelling a triangular plot of land at the rate of Rs 12 per sq m is Rs 81000. If the sides of the plot are in the ration 13 : 12 : 5, find its sides.

Q20. Each of the equal sides of an isosceles triangle measures 2 cm more than its height, and the base of the triangle measures 12 cm. Find the area of the triangle.

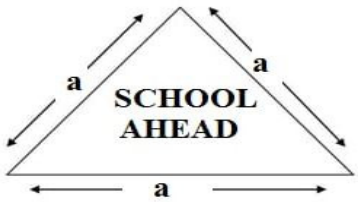
Q21. Find the cost of turfing a triangular field at the rate of Rs. 5/m^2 having lengths of its sides as 40 m, 70 m and 90 m. (Take $\sqrt{20} = 4.47$)

Q22. The sides of a triangular field are 24 m, 7 m and 25 m. Find the numbers of triangular beds that can be made of sides 3 m, 4 m and 5 m.

Case-study based questions:

Q23. The traffic signs are located on the side or top of the road. They give direction on how we should behave on the road, so that the traffic can proceed safely and smoothly. Everyone must know the traffic signs. To prevent the children of school, a traffic signal board, indicating "SCHOOL AHEAD" is an equilateral triangle with side a (shown in below figure)

Answer the following questions by looking the figure.



i. Find the perimeter of the signal board :

a. 2a/3 b. 2a c. 3a d. 3a/2

ii. Find the area the triangle :

a. $(\sqrt{3}/4)\, a^2$ b. $(4/\sqrt{3})a^2$ c. $\sqrt{3}a^2$ d. $4a^2$

iii. If its perimeter is 240cm, then find the area of the signal board :

a. 1600cm^2 b. $1600\sqrt{3}cm^2$ c. 800cm^2 d. $800\sqrt{3}cm^2$

iv. If in any equilateral triangle ABC, AB =7cm, then BC=?

a. 7cm b. 3.4cm c. 10.5cm d. 14 cm

v. If its perimeter is 360 cm, then the area of the signal board :

a. $1600\sqrt{3}cm^2$ b. $2600\sqrt{3}cm^2$

c. $3600\sqrt{3}cm^2$ d. $4600\sqrt{3}cm^2$

CHAPTER - 13 (SURFACE AREAS AND VOLUMES)

Solve the following questions:

Q1. The surface area of a sphere of radius 14cm is :

a. 1386 Sq.cm b. 1400 Sq.cm c. 2464 Sq.m d. 2000 sq.cm

Q2. What is the total surface area of a cone having radius $\frac{r}{2}$ and height 21?

a. $\pi r\left(1+\frac{r}{4}\right)$ b. $\pi r\left(r+\frac{1}{4}\right)$ c. $\pi r\left(1+\frac{r}{2}\right)$ d. $\pi r\left(4+\frac{1}{2}\right)$

Q3. If a right circular cone has radius 4cm and slant height 5cm then what is its volume?

a. 16π cm^3 b. 14π cm^3 c. 12π cm^3 d. 18π cm^3

Q4. The radius of a hemisphere is r. what is its volume?

a. $\frac{4}{3}\pi r^3$ b. $\frac{2}{3}\pi r^3$ c. $4\pi r^3$ d. $2\pi r^3$

Q5. What is the total surface area of a hemisphere of radius r?

a. $4\pi r^2$ b. πr^2 c. $2\pi r^2$ d. $3\pi r^2$

Q6. If the radius of a sphere is doubled, then what is the ratio of their surface area?

a. 1 b. 2:1 c. 1:4 d. 4:1

Q7. The diameter of the base of a cone is 10.5 cm, and its slant height is 10cm. The curved surface area is :

a. 150 sq.cm b. 165 sq.cm c. 177 sq.cm d. 180 sq.cm

Q8. The height of a cone is 21cm and its slant height is 28cm. The volume of the cone is :

a. 7356 cm^3 b. 7546 cm^3 c. 7506 cm^3 d. 7564 cm^3

Q9. The radius of a sphere is 2r, then its volume will be :

a. $\frac{4}{3}\pi r^3$ b. $4\pi r^3$ c. $\frac{8\pi r^3}{3}$ d. $\frac{32}{3}\pi r^3$

Q10. The radius of a hemispherical ballon increases from 6cm to 12cm as air is being pumped into it. The ratios of the surface areas of the balloon in the two cases is :

a. 1 : 4 b. 1 : 3 c. 2 : 3 d. 2 : 1

Q11. The radius and the lateral surface area of a right circular cone are 8cm and 10cm^2 respectively. Find its slant height.

Q12. If the volume and the base area of a right circular cone are 48π cm^3 and 12π cm^2 respectively, then find the height of the cone.

Q13. Find the total surface area of a solid hemisphere with radius 7cm.

Q14. Find the surface area of a sphere whose diameter is d.

Q15. Write volume of a hemisphere in terms of surface area of the corresponding sphere.

Q16. A joker's cap is in the form of a right circular cone of base radius 7cm and height 24cm. Find the area of the sheet required to make 10 such caps.

Q17. Curved surface area of a cone is 154 cm^2 and its slant height is 14cm. Find :

i. Radius of the base.

ii. Total surface area of the cone.

Q18. The radius and height of a right circular cone are in the ratio 2:3. Find its slant height, if its volume is 100.48 cm^3. (take π = 3.14)

Q19. A hemispherical bowl made of iron has inner radius 7cm. Find the cost of polishing inner hollow portion of bowl at the rate of Rs. 10 per 100 cm^2.

Q20. A boy has a spherical sweets of a radius 4cm. A girl has 8 spherical sweets each of radius 2cm. Find the ratio of the volume of the sweets the boy has to the sweets the girl has.

Q21. A solid metallic sphere of diameter 4.2cm is dropped in a container full of water, so that it is completely immersed in water. Find the amount of water displaced by the sphere. (Use $\pi = \frac{22}{7}$)

Q22. A shopkeeper has one spherical laddoo of radius 5 cm. With the same amount of material, how many laddoos of radius 2.5cm can be made?

Q23. The floor area of a tent which is in the form of a right circular cone is $\frac{3168}{7}$ m^2. The area of canvas required for making the tent is $\frac{3960}{7}$ m^2. Find the air capacity of the tent.

Q24. The internal and external diameters of a hollow hemispherical vessel are 24 cm and 25 cm respectively. If the cost of painting 1 cm^2 of the surface area is Rs. 0.05, find the total cost of painting the vessel all over.

Q25. The water for a factory is stored in a hemispherical tank whose internal diameter is 14cm. The tank contains 50 KL of water. Water is pumped into the tank to fill it to its capacity. Calculate the volume of water pumped into the tank.

Case-study based questions:

Q26. Once four friends Rahul, Arun, Ajay and Vijay went for a picnic at a hill station. Due to peak season, they did not get a proper hotel in the city. The weather was fine so they decided to make a conical tent at a park. They were carrying 300m^2 cloth with them. As shown in the figure they made the tent with height 10m and diameter 14m. The remaining cloth was used for floor.

i. How much cloth was used for the floor?

a. 31.6 m^2 b. 16m^2 c. 10m^2 d. 20 m^2

ii. What was the volume of the tent?

a. 300m^3 b. 160m^3 c. 513.3 m^3 d. 500m^3

iii. What was the area of the floor?

a. 50 m^2 b. 100 m^2 c. 150m^2 d. 154 m^2

iv. What was latent height of tent?

a. 12m b. 12.2 m c. 15m d. 17 m

CHAPTER - 14 (STATISTICS)

Solve the following questions:

Q1. Which one of the following is not the graphical representation of statistical data?

a. bargraph b. histogram

c. frequency polygon d. comulative frequency distribution

Q2. In a histogram, the area of each rectangle is proportional to :

a. the class mark of the corresponding class interval

b. the class size of the corresponding class interval

c. frequency of the corresponding class interval

d. cumulative frequency of the corresponding class interval

Q3. In a histogram the class intervals or the groups are taken along :

a. y - axis

b. x - axis

c. both of x - axis and y - axis

d. in between x and y - axis

Q4. We can draw histogram, if we have :

a. grouped and continuous classes b. non - continuous classes

c. classes without frequency d. none of the above

Q5. The following data gives amount of manure (in thousand tonnes) manufactured by a company during some years:

Year	1992	1993	1994	1995	1996	1997
Manure (in thousand tonnes)	18	35	45	30	85	85

i. Represent the above data with help of a bar graph.

ii. The consecutive years during which the maximum decrease in manure production took place is?

Q6. The distribution of weights (in kg) of 87 people is given below :

Weight (in kg)	30-35	35-40	40-45	45-50	50-55	55-60
Frequency	12	20	25	15	10	5

Construct a histogram for the above distribution.

Q7. Construct a histogram for the following data :

Class Interval	Frequency
10-19	20
20-29	15
30-39	45
40-49	60
50-59	75

Q8. Construct a frequency polygon with histogram, for the following information :

Class Interval	Frequency
30-45	4
45-60	8
60-75	15
75-90	19

Q9. The daily wages of 100 workers (in Rs.) in a factory are given below :

Daily wages (in Rs.)	150-200	200-250	250-300	300-350
No. of workers	16	29	37	18

Draw a frequency polygon for the given data.

Q10. Draw a frequency polygon for the data given below, without drawing a histogram :

Class	150-160	160-170	170-180	180-190	190-200	200-210
Frequency	5	15	20	25	15	10

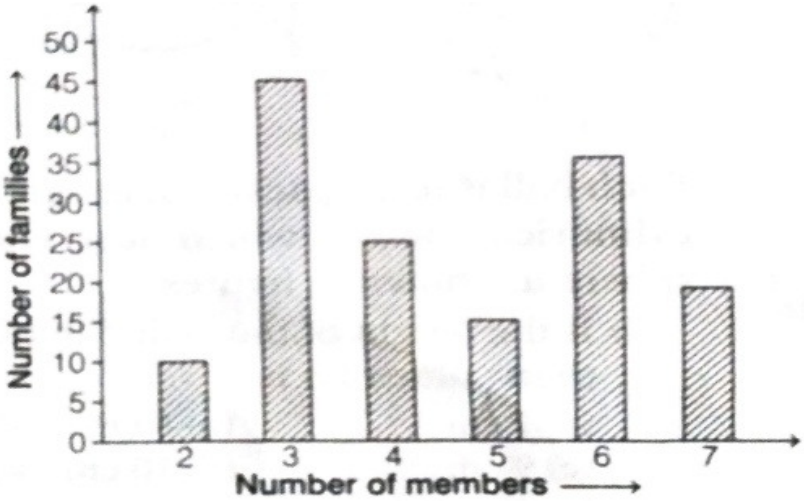
Q11. The monthly profit (in Rs.) of 100 shops are distributed as follows :

Profit per shop (in Rs.)	0-50	50-100	100-150	150-200	200-250	250-300
No. of shops	12	18	27	20	17	6

Draw a frequency polygon for it.

Case-study based questions:

Q12. Rajasthan Government conduct a survey of 150 families of a town, the number of members in each family was recorded and the data has been represented by the following bar graph.



i. What information does bar graph give?

a. Number of member b. Number of families

c. Number of town d. Town population

ii. How many families have 2 members each?

a. 5 b. 10 c. 30 d. 45

iii. How many families have 6 members?

a. 30 b. 35 c. 45 d. 25

iv How many people live alone?

a. 0 b. 1 c. 2 d. 3

v. Which type of family is most common?

a. 3 members b. 4 members c. 5 members d. 6 members