DEHRADUN PUBLIC SCHOOL
ASSIGNMENT (2023-24)
SUBJECT- MATHEMATICS (041)
CLASS - IX

Chapter- 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 $\sqrt[3]{2} \cdot \sqrt[4]{2} \cdot \sqrt[12]{32}$ 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 rationalizing 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. Assertion (A): 6.527 is a terminating decimal number.
Reason (R): Any decimal number is said to be a recurring decimal number, if set of digits is repeated periodically.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q11. Assertion (A): The rationalizing factor of $8-\sqrt{7}$ is $8+\sqrt{7}$.
Reason (R): If the product of two irrational numbers is irrational, then each one is said to be the rationalizing factor of the other.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. How many rational numbers are between two rational numbers?

Q13. Is every irrational or rational number a real number?

Q14. Write the value of 1.999... in the form $\frac{p}{q}$, where p, q are integers, $q \neq 0$.

Q15. Write the rationalizing factor of $\frac{1}{\sqrt{7}-\sqrt{4}}$.

Q16. Find the value of $(81)^{0.16+0.09}$.

Q17. Evaluate: $\left(\frac{1}{2}\right)^5 \times \left(\frac{-2}{3}\right)^4 \times \left(\frac{3}{5}\right)^{-1}$.

Q18. Simplify: $\sqrt[4]{81}-8\sqrt[3]{216}+15\sqrt{4}+\sqrt{255}$.

Q19. Simplify: $\frac{1}{2+\sqrt{5}}+\frac{1}{\sqrt{5}+\sqrt{6}}+\frac{1}{\sqrt{6}+\sqrt{7}}+\frac{1}{\sqrt{7}+\sqrt{8}}$.

Q20. Simplify: $\frac{7\sqrt{3}}{\sqrt{10}+\sqrt{3}}-\frac{2\sqrt{5}}{\sqrt{6}+\sqrt{5}}-\frac{3\sqrt{2}}{\sqrt{15}+3\sqrt{2}}$.

Q21. If $a=\dfrac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b=\dfrac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$, then find the value of a^2+b^2-5ab.

Q22. If $a=5+2\sqrt{6}$ and $b=\dfrac{1}{a}$ then what will be the value of a^2+b^2 ?

Q23. If $a=9-4\sqrt{5}$, then find the value of $a-\dfrac{1}{a}$.

Q24. If $\left(\dfrac{3}{4}\right)^6\times\left(\dfrac{16}{9}\right)^5=\left(\dfrac{4}{3}\right)^{x+2}$, find the value of x.

Q25. If $x=2+\sqrt{3}$, find the value of $x^2+\dfrac{1}{x^2}$.

Case-study based question:

Q26. In a coaching center, one day a teacher told student about the laws of exponents, which was defined below:

Suppose $a>0, b>0$ be real numbers and let m and n be rational numbers. Then

1. $a^m\times a^n=a^{m+n}$
2. $\dfrac{a^m}{a^n}=a^{m-n}$
3. $(a^m)^n=a^{mn}$
4. $\left(\dfrac{a}{b}\right)^m=\dfrac{a^m}{b^m}$
5. $(ab)^m=a^m b^m$

On the basis of above information, solve the following questions:

i. Find the value of $2^3\times 2^4$.

ii. If $8^{x+1}=64$, then find the value of x.

iii. Find the value of $\left((81)^{1/2}\right)^{1/2}$.

OR

If $x = 0.000216$, then find the value of $(x)^{1/3}$.

Chapter- 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 $p(x) = x^2 - 2\sqrt{2} + 1$, then $p(2\sqrt{2})$ 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. $x^3 + y^2 + 2xy$ b. $x^3 + y^2 - xy$ 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. Assertion (A): The degree of the polynomial $(x-2)(x-3)(x+4)$ is 4.
Reason (R): The number of zeroes of a polynomial is the degree of that polynomial.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q11. Assertion (A): If $p(x) = x^2 - 4x + 3$, then 3 and 1 are the zeroes of the polynomial $p(x)$.
Reason (R): Number of zeroes of a polynomial cannot exceed its degree.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. If $x+y+2=0$, then write the value of x^3+y^3+8.

Q13. Write the factors of polynomial $4x^2+y^2+4xy+8x+4y+4$.

Q14. Find the coefficient of x^2 in $(x-2)^3$.

Q15. Find the value of 249^2-248^2.

Q16. Find the value of 95 × 96.

Q17. Find the value of the polynomial $p(z)=3z^2-4z+\sqrt{17}$, when z = 3.

Q18. If –1 is a zero of the polynomial $p(x)=ax^3-x^2+x+4$, find the value of a.

Q19. Using factor theorem, show that x – y is a factor of $x(y^2-z^2)+y(z^2-x^2)+(x^2-y^2)$.

Q20. Check whether (p + 1) is a factor of $(p^{100}-1)$ and $(p^{101}-1)$.

Q21. If a + b + c = 7 and ab + bc + ca = 20, find the value of $a^2+b^2+c^2$.

Q22. Find the product of $(3x+2y)(3x-2y)(9x^2+4y^2)$.

Q23. If $\left(\frac{8}{15}\right)^3-\left(\frac{1}{3}\right)^3-\left(\frac{1}{5}\right)^3=\frac{x}{75}$, find x.

Q24. Factorise : $(x-3y)^3+(3y-7z)^3+(7z-x)^3$.

Q25. Expand:

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

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

Q26. If $x+\frac{1}{x}=3$, find the value of $x^2+\frac{1}{x^2}$ and $x^3+\frac{1}{x^3}$.

Q27. Determine whether the indicated numbers are zeroes of the given polynomial.

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

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

Q28. If $p(x)=x^3+3x^2-2x+4$, find the value of $p(-2)+p(1)+p(0)$.

Q29. If x – 2y = 11 and xy = 8, find the value of x^3-8y^3.

Case-study based question:

Q30. A teacher told 10 students to write a polynomial on the blackboard. The students wrote the following polynomials:

1.	$\sqrt{5}x^3+1$	2.	$20x^3+3x+8$
3.	$x-2$	4.	$x^2+\frac{12x}{35}+\frac{1}{35}$
5.	$3x^3-4x^2-12x+16$	6.	$-2x-5$
7.	$\frac{\pi}{2}x^2+x$	8.	$9x^2-361$
9.	_____ $-64-3x+24x$	10.	$8x^3$

On the basis of the above information, solve the following questions:

i. How many students wrote quadratic polynomial?

ii. How many students wrote a binomial?

iii. Find the zeroes of the polynomial $p(x)=-2x-5$.

OR

Factorise : $9x^2-361$.

Chapter- Coordinate Geometry

Solve the following questions:

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

a. 0 b. 1 c. 2 d. any number

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. 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

Q5. 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

Q6. Ordinate of all points on the x - axis is :

a. 0 b. 1 c. 2 d. –1

Q7. The point at which the two coordinate axes meet is called the :

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

Q8. 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

Q9. Assertion (A): The point (-3, 0) lies on Y-axis and (0, 4) lies on X-axis.
Reason (R): Every point on the X-axis has zero distance from X-axis and every point on the Y-axis has zero distance from Y-axis.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q10. Assertion (A): A point whose abscissa is 3 and ordinate is - 4 lies in IV quadrant.
Reason (R): A point whose sign is the form of (-, +) lies in the IInd quadrant.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

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

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

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

Q14. If the points A(0, 2), B(0, –6) and C(a, 3) lie on y-axis, then find the value of a.

Q15. 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?

Q16. Name the quadrants in which the following points lie:

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

Q17. Which of the following points lie on x-axis? Which on y-axis?

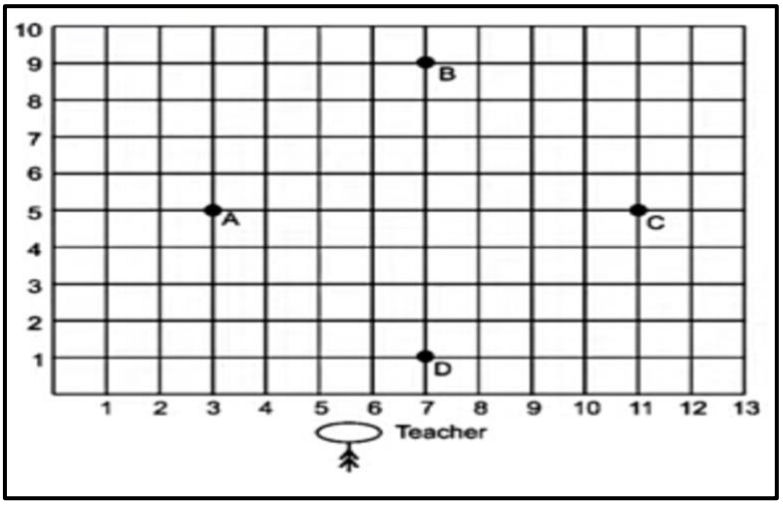
A(0, 2), B(5, 6), C(-3, 0), D(0, -3), E(0, 4), F(6, 0), G(3, 0)

Q18. If $x > 0$ and $y > 0$, then the point (x, y) lies in which quadrants?

Q19. In which quadrants or on which axis do each of the points (4, -2), (-3, 7), (-1, -2), (3. 6) lie?

Case-study based question:

Q20. 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 the coordinate of A?

ii. What is the coordinate of B?

iii. What is the coordinate of C and D?

OR

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

Chapter- Linear Equations in Two Variables

Solve the following questions:

Q1. Which of the following is not a linear equation?

a. $ax + by + c = 0$ b. $0x + 0y + c = 0$ c. $0x + by + c = 0$ d. $ax + 0y + c = 0$

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 respective values when substituted for x and y in the given equation, satisfies it

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. Assertion (A): If x = -1 and y = 2 is a solution of the equation 3x + 2y = k, then the value of k is 1.
Reason (R): The solution of the line will satisfy the equation of the line.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. Assertion (A): The linear equation 2x + 3y = 5 has a unique solution.
Reason (R): A linear equation in two variables has infinitely many solutions.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q13. Write the equation 2x = 9, in the standard form of a linear equation in two variables.

Q14. 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.

Q15. How many solution(s) does the equation y = 5x + 2 have?

Q16. Write a linear equation in two variables whose one solution is given by the point (a, b).

Q17. Find the value of x for the linear equation $2\sqrt{2}x-3y+4=0$ corresponding to y = 2.

Q18. 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?

Q19. Show that x = 1, y = 4 satisfy the linear equation 2x + y − 6 = 0.

Q20. If x = $2\sqrt{2}$ and y = $\sqrt{2}$ satisfy the linear equation 3x + ky = $4\sqrt{2}$, find the value of k. Can there be more than one value of k?

Q21. 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?

Q22. Write any four solutions for the following linear equation ax – by = 2ab.

Case-study based question:

Q23. On his birthday, Manoj planned that this time he celebrates his birthday in a small orphanage. He bought apples to give to children and adults working there. Manoj donated 2 apples to each children and 3 apples to each adult working there along with birthday cake. He distributed 60 total apples.

i. How to represent the above situation in linear equations in two variables by taking the number of children as 'x' and the number of adults as 'y'?

ii. If the number of children is 15, then find the number of adults.

OR

If the number of adults is 12, then find the number of children.

iii. Find the value of b, if x = 5, y= 0 is a solution of the equation 3x + 5y = b.

Chapter- Introduction to Euclid's Geometry

Solve the following questions:

Q1. The three steps from solids to points are :

a. Solids - surfaces - lines - points
b. Solids - lines - surfaces - points
c. Lines - points - surfaces - solids
d. Lines - surfaces - points - 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. Euclid divided his famous treatise "The Elements" into :

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

Q8. Euclid belongs to the country :

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

Q9. Assertion (A): There can be infinite number of lines that can be drawn through a single point.
Reason (R): From a single point, we can draw only two lines.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q10. Assertion (A): According to the Euclid's first axiom, 'Things which are equal to the same thing are also equal to one another.'
Reason (R): If AB = MN and MN = PQ, then AB = PQ.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

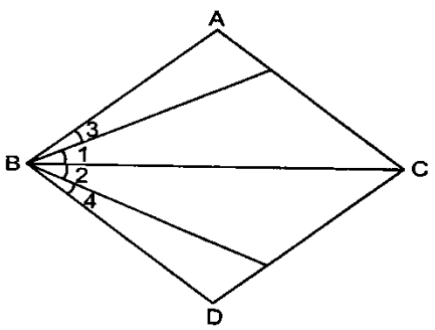
Q11. How many lines do pass through two distinct points?

Q12. How many lines can pass through a given point?

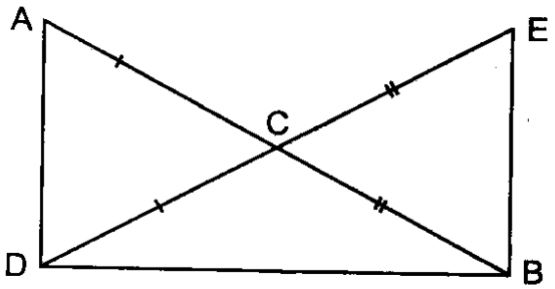
Q13. How many line segments can be determined by three collinear points?

Q14. Define parallel lines.

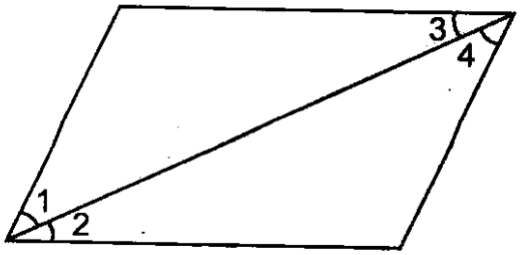
Q15. In Figure we have $\angle 1 = \angle 2$, $\angle 3 = \angle 4$. Show that $\angle ABC = \angle DBC$. State the Euclid's axiom used.



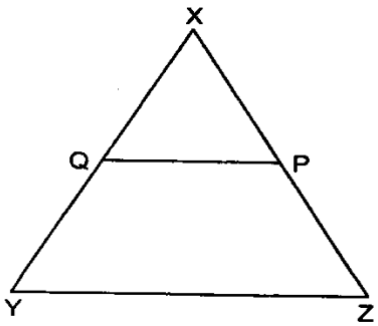
Q16. In Figure, AC = DC, CB = CE. Show that AB =DE. Write Euclid's axiom to support this.



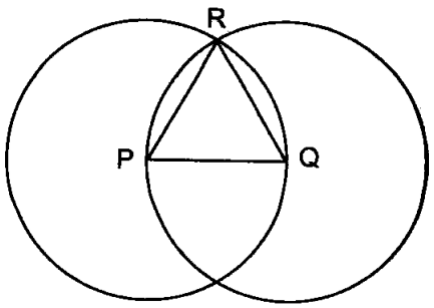
Q17. In Figure, if $\angle 1 = \angle 3$, $\angle 2 = \angle 4$ and $\angle 3 = \angle 4$, write the relation between $\angle 1$ and $\angle 2$, by using an Euclid's axiom. Write the axiom.



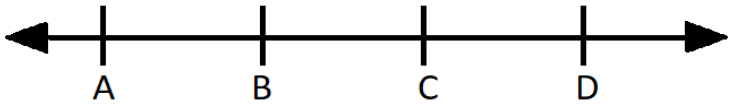
Q18. In Figure, if QX = $\frac{1}{2}$ XY, PX = $\frac{1}{2}$ XZ and QX = PX, show that XY = XZ.



Q19. P and Q are the centers of two intersecting circles. Prove that PQ = QR = PR.



Q20. In the given figure, if AB = CD, then prove that AC = BD. Also, write the Euclid's axiom used for proving it.



Case-study based question:

Q21. In a class of Mathematics, the teacher taught a chapter 'Introduction to Euclid's Geometry' in which they taught about different postulates and axioms.

On the basis of above information, solve the following questions:

i. How many axiom's are exist in Euclid's?

ii. Write any one of the Euclid's postulate.

iii. Write Euclid's axiom 5.

OR

By which Euclid's axiom 'If $x + y = 5$, then $x + y - z = 5 - z$' ?

Chapter- 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

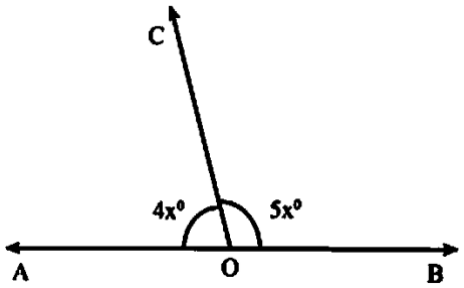
Q3. The measure of an angle is five times its complement. The angle measures :

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 measure of the larger angle is :

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?

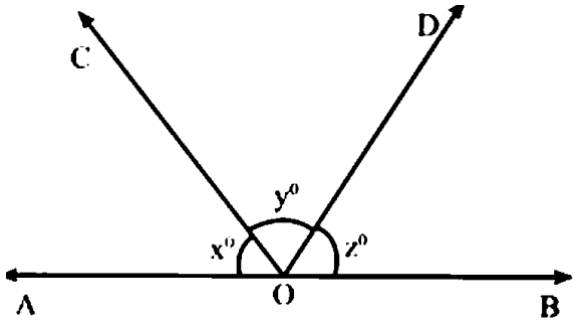
a. Through a given point, only one straight line can be drawn.

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.

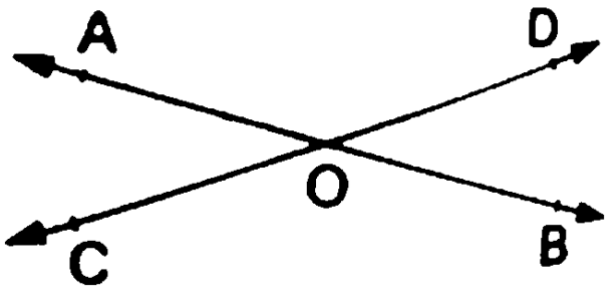
d. A line segment can be produced to any desired length.

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



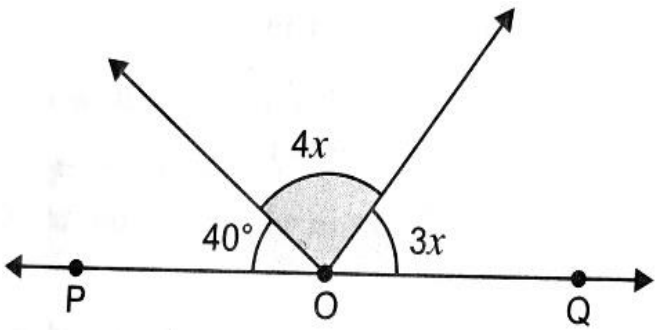
a. 60^0 b. 80^0 c. 48^0 d. 72^0

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. Assertion (A): If angles 'x' and 'y' form a linear pair of angles and x = 70°, then y = 110°.
Reason (R): Sum of linear pair of angles is always 180°.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. Assertion (A): The pair of angles 112°, 78° is supplementary.
Reason (R): The sum of two angles is 180°, then it is supplementary.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

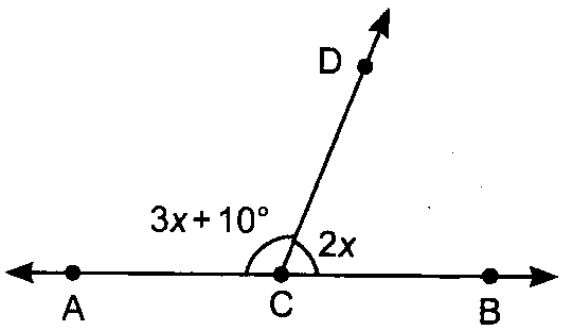
d. Assertion (A) is false but Reason (R) is true.

Q13. Find the angle which exceeds its complementary angle by 30^0.

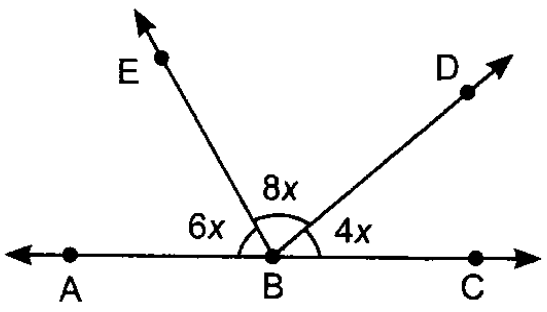
Q14. Two supplementary angles are in the ratio 2:7. Find the measure of angles.

Q15. If an angle is 14^0 more than its complement, then find its measure.

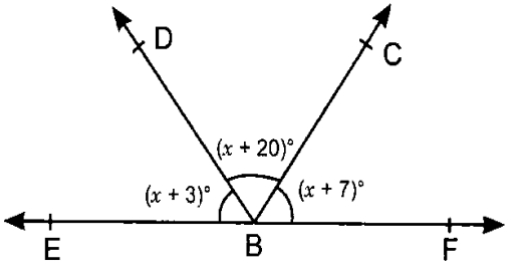
Q16. In figure, ACB is a line. If $\angle DCA = 3x + 10^0$ and $\angle DCB = 2x$, then find the value of x.



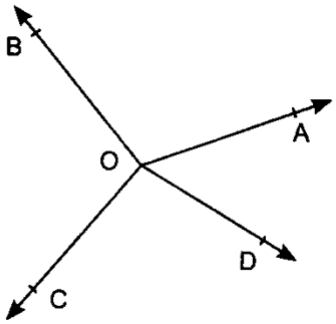
Q17. In figure, find the measure of $\angle DBC$:



Q18. In figure, find the value of x.

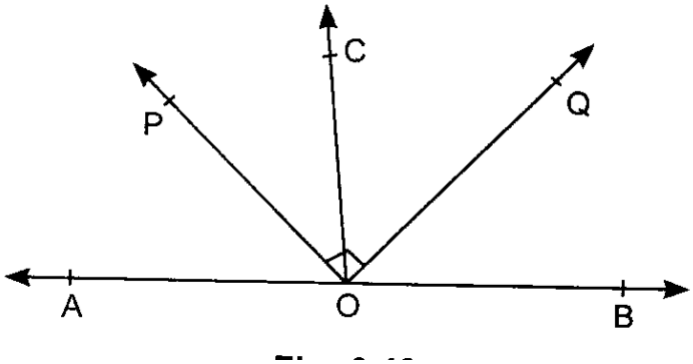


Q19. In figure, prove that $\angle AOB + \angle BOC + \angle COD + \angle DOC = 360^0$.

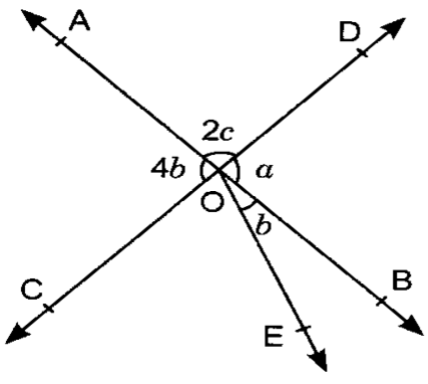


Q20. "If two lines intersect each other, then the vertically opposite angles so formed are equal." Prove it.

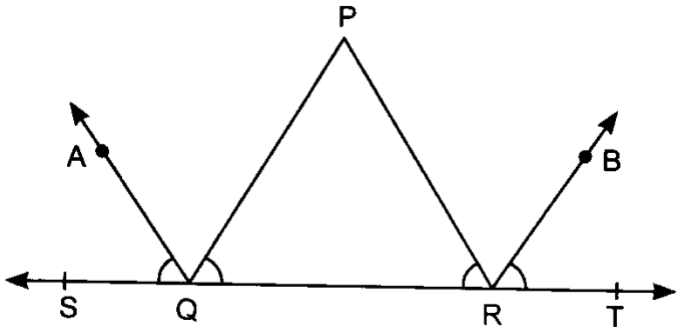
Q21. In the figure, OP bisects $\angle AOC, OQ$ bisects $\angle BOC$ and $OP \perp OQ$. Show that points A, O and B are collinear.



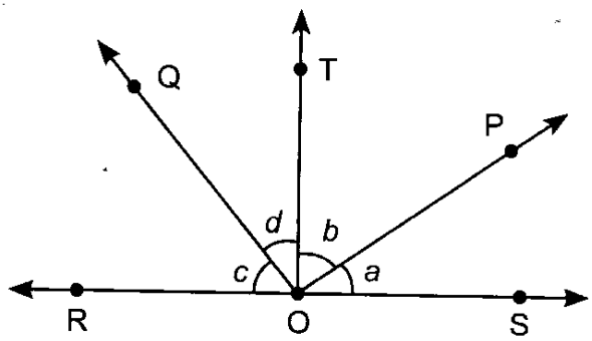
Q22. In the figure, two straight lines AB and CD intersect each other at O. If $\angle COE = 70^0$, find the values of a, b and c.



Q23. In figure, QA and RB are the bisectors of $\angle PQS$ and $\angle PRT$ respectively, and $\angle SQA = \angle TRB$. Prove that $\angle PQR = \angle PRQ$.

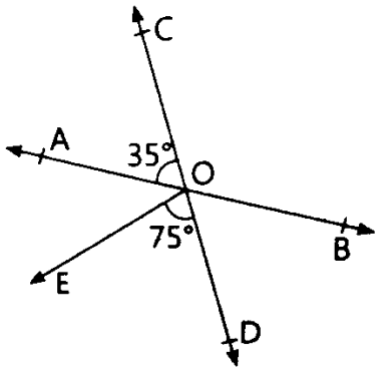


Q24. In figure, a + b = c + d, then prove that $\angle ROT = 90^0$.



Case-study based question:

Q25. A math's teacher was teaching students about intersecting lines. Suppose AB and CD are two intersecting lines, which meets at point O. In this point O, she draw a line OE and all these lines were making different angles with each other.
After explaining the description of the figure, she asked the following questions from the students.



On the basis of the above information, solve the following questions.

i. Find the measure of $\angle$ BOD.
ii. Check whether pair of angles $\angle$ AOC and $\angle$ BOC makes a linear pair.
iii. Which of the following angles form a non collinear lines?
   a. A, O, B b. C, O, E

OR

Find the measure of $\angle$ AOE.

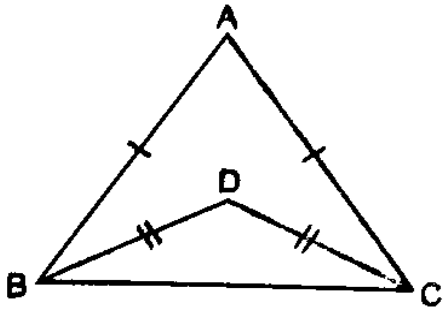
Chapter-Triangles

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. In the figure, AB = AC and BD = DC. Then the ratio of $\angle ABD : \angle ACD$ is:



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

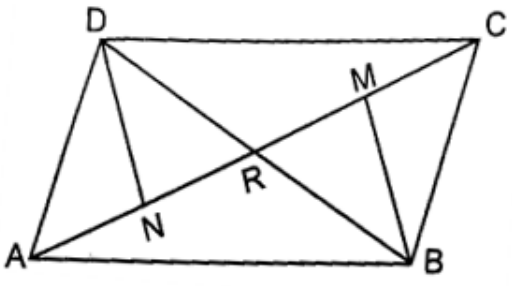
Q3. It is given that $\Delta ABC \cong \Delta FDE$ and AB = 5cm, $\angle B = 40^0$ and $\angle A = 80^0$. Then which of the following is true?

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

Q4. 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

Q5. In quadrilateral ABCD, BM and DN are drawn perpendiculars to AC such that BM = DN. If BR = 8cm, then BD is :



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

Q6. 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

Q7. 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

Q8. 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

Q9. In ΔABC, AB = AC and $\angle B = 50^0$, then $\angle C =$

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

Q10. 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

Q11. Assertion (A): In Δ PQR, PQ = QR and $\angle$ R=75°, then $\angle$ P is 52°.
Reason (R): In a triangle, angles opposite to equal sides are equal.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. Assertion (A): If we draw two triangles with angles 40°, 60° and 80° and the length of the sides of one triangle be different than that of the corresponding sides of the other triangle, then two triangles are not congruent.
Reason (R): If two triangles are constructed which have all corresponding angles equal but have unequal corresponding sides, then two triangles cannot be congruent to each other.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

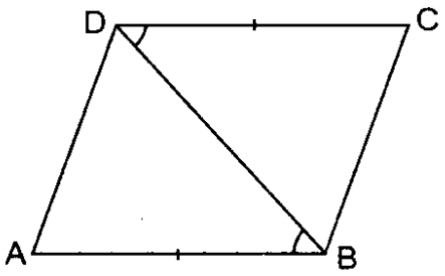
b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

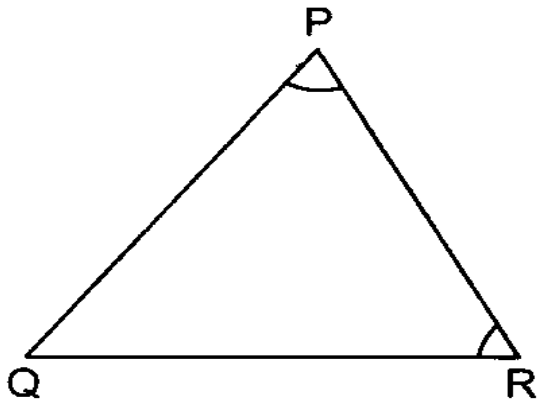
d. Assertion (A) is false but Reason (R) is true.

Q13. In ΔABC and ΔDEF, If AB = DE, $\angle A = \angle D$ and AC = DF, then write the criterion of congruency condition.

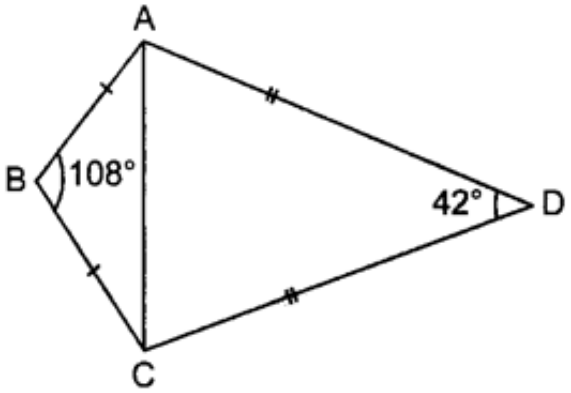
Q14. In the figure, if AB = DC and $\angle ABD = \angle CDB$, which congruence rule would you apply to prove $\Delta ABD \cong \Delta CDB$?



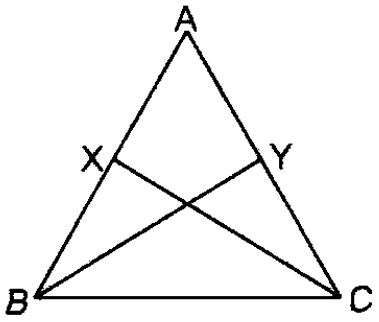
Q15. In $\Delta PQR, \angle R = \angle P$ and PR – PQ = 3cm. If the perimeter of ΔPQR is 15cm, then find PR.



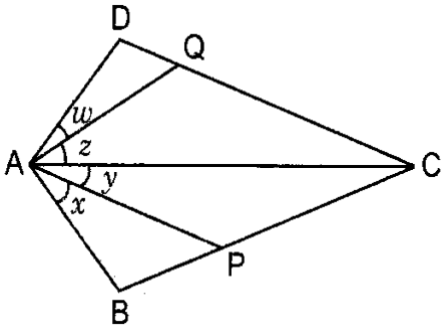
Q16. In the figure, ABCD is a quadrilateral in which AB = BC and AD = DC. Find the measure of $\angle BCD$.



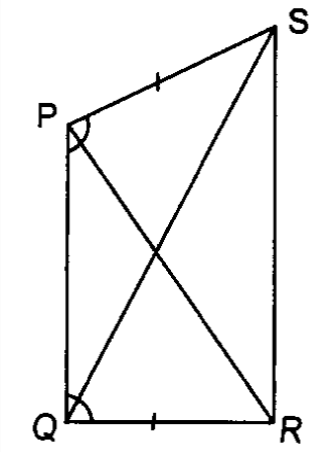
Q17. In the, ABC is a triangle in which AB = AC. X and Y are points on AB and AC such that AX = AY. Prove that $\Delta ABY \cong \Delta ACX$.



Q18. In the figure, if AB = AD, $\angle x = \angle w$ and $\angle y = \angle z$, then prove that AP = AQ.



Q19. In the figure, PS = QR and $\angle SPQ = \angle RQP$. Prove that :



i. $\Delta PQS \cong \Delta QPR$

ii. PR = QS

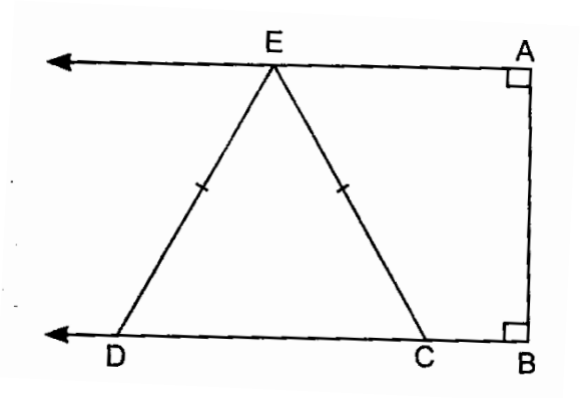
iii. $\angle QPR = PQS$

Q20. In the figure, $AB \perp AE$, $BC \perp AB$, CE = DE and $\angle AED = 120^0$. Find

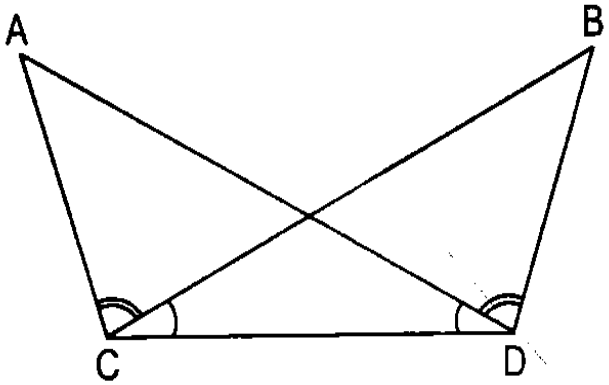
i. $\angle EDC$

ii. $\angle DEC$

iii. Hence, prove that EDC is an equilateral triangle.



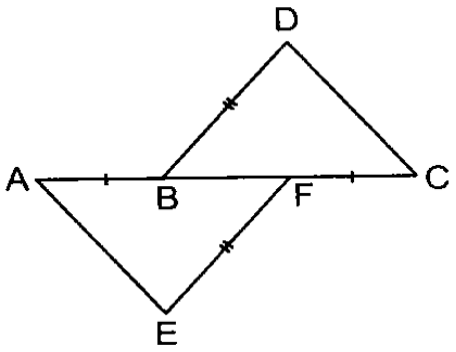
Q21. In the figure, $\angle BCD = \angle ADC$ and $\angle ACB = \angle BDA$. Prove that AD = BC and $\angle A = \angle B$.



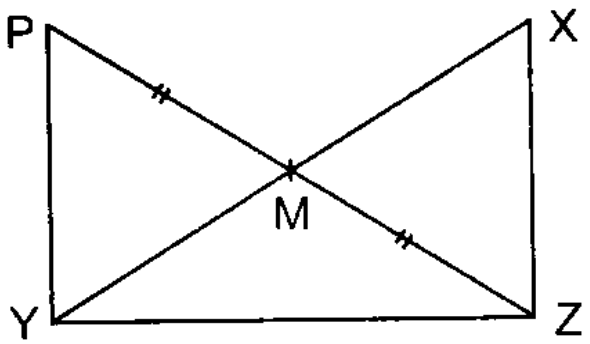
Q22. In the figure, AB = CF, EF = BD and $\angle AFE = \angle CBD$, prove that

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

ii. AE = CD



Q23. 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.

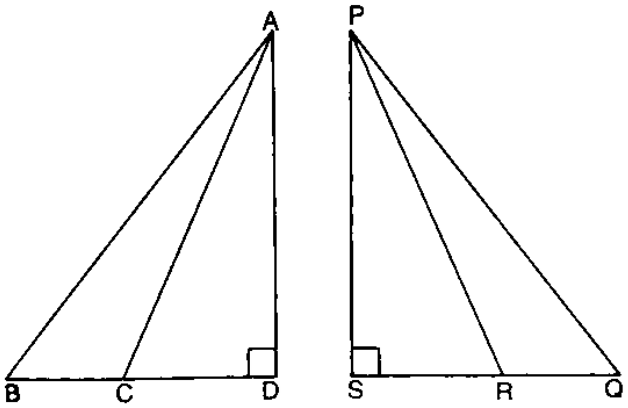


Show that :

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

Case-study based question:

Q24. Mohit and Mitul, two students of the same class are playing with two cards, as shown in figure, such that AB = PQ, AD $\perp$ BD, PS $\perp$ QS, BC = QR and DC = SR.



Based on the given figures, answer the following questions:

i. Name the triangle congruent to Δ ABD.

ii. Name the triangle congruent to Δ PSR.

OR

$\angle$ BAC =…….

ii. Name the triangle congruent to Δ ABC.

Chapter- 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. 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 to A, if P and Q are the mid-points of OB and OC respectively, the DEQP is :

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

Q6. 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

Q7. 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. $\angle ADE = \angle ECF$

Q8. Assertion (A): The opposite angles of a parallelogram are (2x - 2)° and (52 - x)°. The measure of one of the angle is 34°.
Reason (R): Opposite angles of a parallelogram are equal.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q9. Assertion (A): PQRS is a square. PR and QS intersect at O. The measure of $\angle$ POQ=90°.
Reason (R): Diagonals of a square bisect each other at right angles.

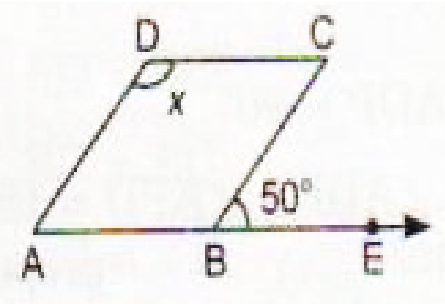
a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

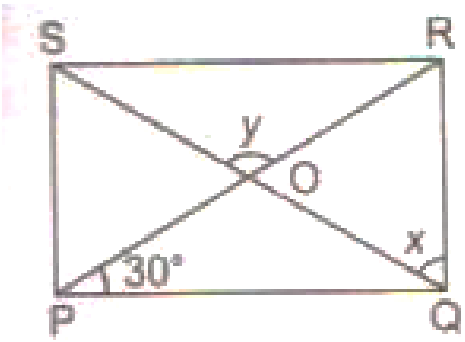
d. Assertion (A) is false but Reason (R) is true.

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



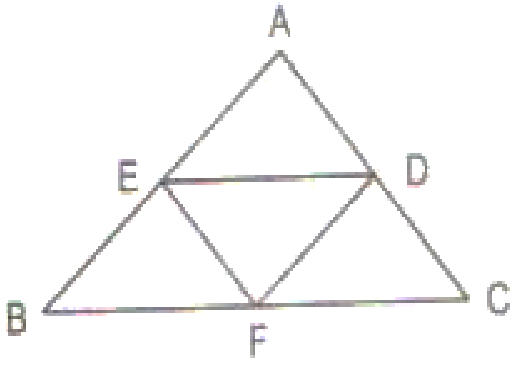
Q11. Two consecutive angles of a parallelogram are in the ratio 1:3, then find the smaller angle.

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 $\angle Q - \angle S$.

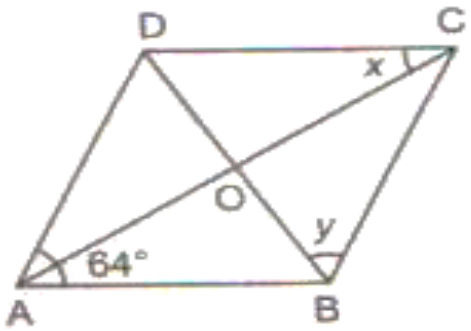
Q14. In the figure points D, E and F are the mid-points of the sides AC, AB and BC of ΔABC. If AB = 4.2cm, BC = 5.6cm and AC = 3.6cm, then find the perimeter of ΔDEF .



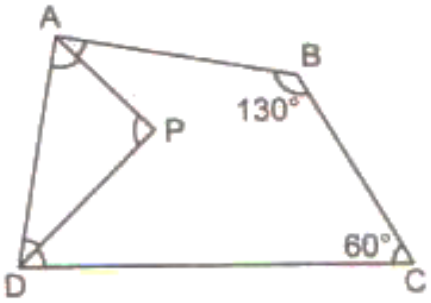
Q15. The perimeter of a parallelogram is 36cm. If the smaller side is 8cm long, find the measure of longer side.

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

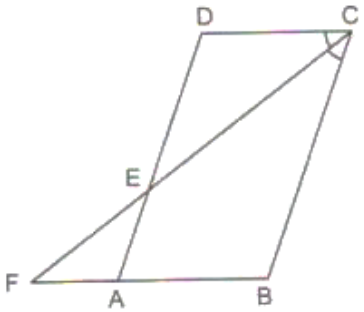
Q17. In the figure, ABCD is a rhombus. Find the value of x and y.



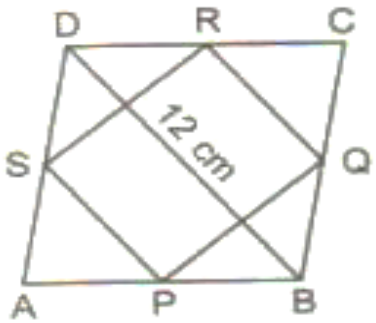
Q18. In figure, ABCD is a quadrilateral, $\angle B = 130^0, \angle C = 60^0$ and angle bisectors of $\angle A$ and $\angle D$ meet at P. Find $\angle APD$.



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.

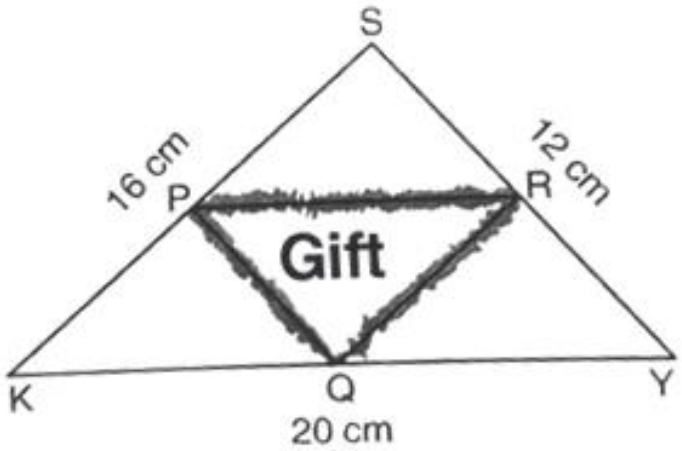


Q20. In Figure, ABCD is a quadrilateral and P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. If BD = 12cm, then find (QR + SP).



Case-study based question:

Q21. Harbans is generous, helpful to needy and orphanage, decided to celebrate his birthday at an orphanage home. He bought 150 return gifts which were triangular in shape with sides measure 12 cm, 16 cm and 20 cm see figure. After, wrapping all the gifts, he also decided to put coloured tape on the sides of the inner triangle formed by joining the mid-points of the sides of each of the triangular gift.



Based on the given information, answer the following questions:

i. Find the length of PQ.

ii. Find the length of PR.

iii. Find the length of the colour tape required for each gift.

OR

Find the total length of the colour tape required for all gifts.

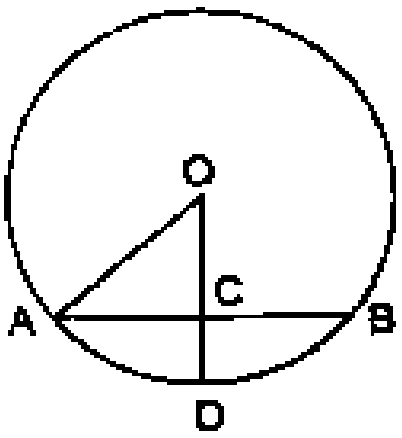
Chapter- Circles

Solve the following questions:

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

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

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

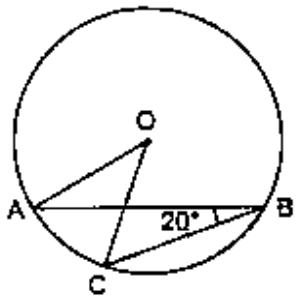


a. 2cm b. 3cm c. 4cm d. 5cm

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

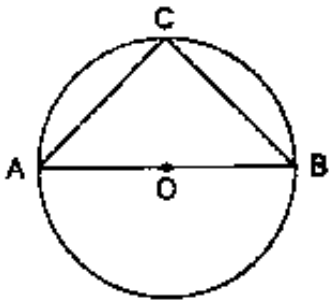
a. 6cm b. 8cm c. 10cm d. 12cm

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



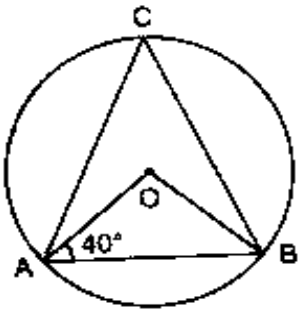
a. 20^0 b. 40^0 c. 60^0 d. 10^0

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



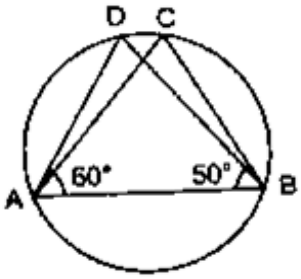
a. 30^0 b. 60^0 c. 90^0 d. 45^0

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



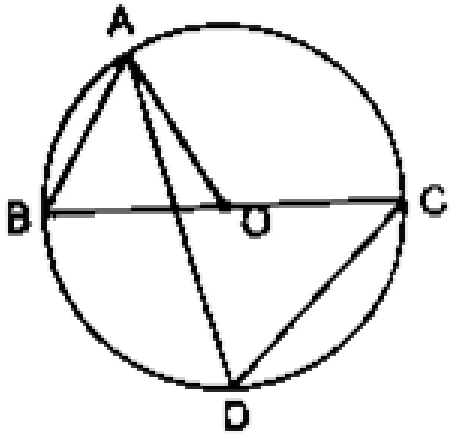
a. 50^0 b. 40^0 c. 60^0 d. 70^0

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



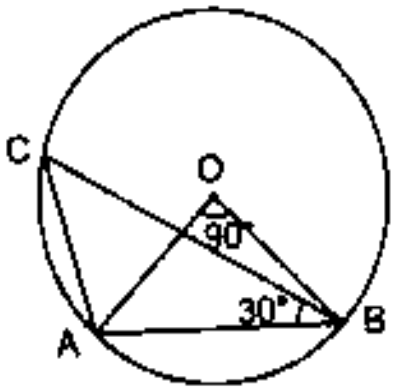
a. 60^0 b. 50^0 c. 70^0 d. 80^0

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



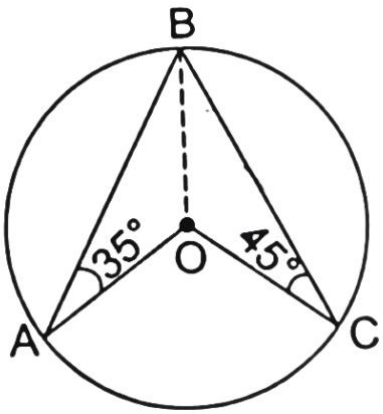
a. 30^0 b. 45^0 c. 60^0 d. 120^0

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. Assertion (A): If O is the centre of a circle and A, B and C are three points on a circle such that $\angle OAB = 35°$ and $\angle OCB = 45°$, then $\angle AOC = 160°$.
Reason (R): Angle subtended by an arc of a circle at the centre of the circle is double the angle subtended by an arc on the circumference.



a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q11. Assertion (A): If two chords subtend equal angles at the centre of a circle (or congruent circles), then the chords are equal.
Reason (R): Equal chords of a circle subtends equal angles at the centre.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

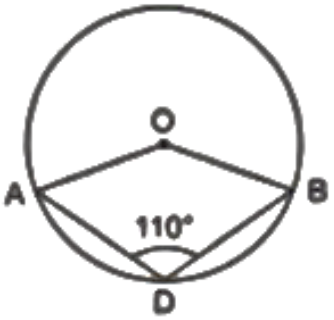
c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

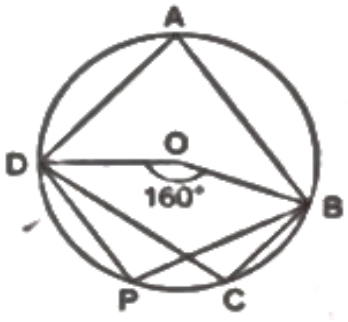
Q12. Chord AB subtends $\angle AOB = 60^0$ at the center of a circle. If OA = 5cm, find the length of AB in cm.

Q13. Find the length of the chord, which is at a distance of 3cm from the centre of a circle of radius 5cm.

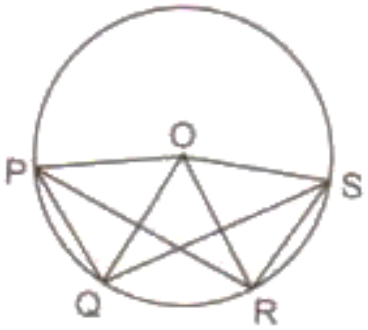
Q14. In the figure, O is the center of the circle passing through A, D and B. If $\angle ADB = 110^0$, find the measure of $\angle AOB$, corresponding to arc ADB.



Q15. In figure, ABCD is a cyclic quadrilateral and O is the centre of the circle. If $\angle BOD = 160^0$, then find $\angle BCD$.

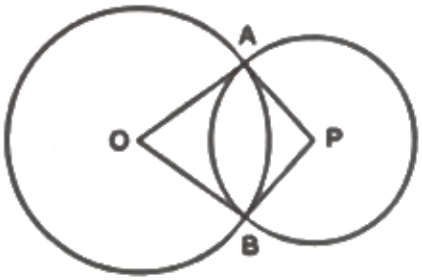


Q16. In the given figure, O is the centre of a circle passing through points P, Q, R and S. If PQ = RS, prove that PR = QS.

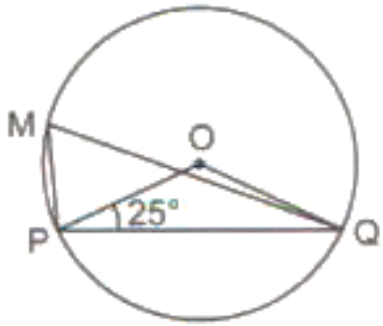


Q17. Two circles of radii 10cm and 8cm intersect and the length of the common chord is 12cm. Find the distance between their centres.

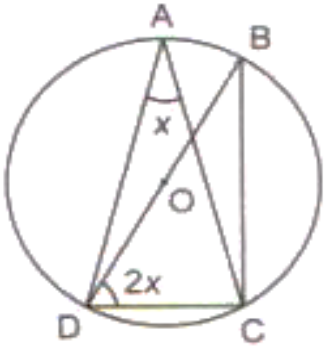
Q18. In Figure, Two circles with centres O and P intersect at A and B as shown in the figure. Prove that $\angle AOP = \angle BOP$.



Q19. In figure, if $\angle OPQ = 25^0$, then find $\angle PMQ$.

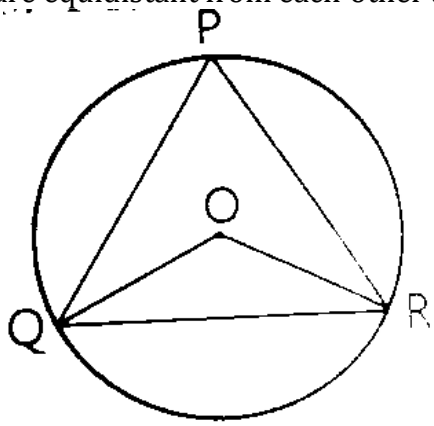


Q20. In figure, O is the centre of the circle. Find the value of x.



Case-study based question:

Q21. Government of India is working regularly for the growth of handicapped persons. For this three STD booths situated at P, Q and R are as shown in the figure, which are operated by handicapped persons. These three booths are equidistant from each other as shown in the figure.



On the basis of the above information, solve the following questions.

i. Which type of ΔPQR in the given figure?

ii. Measure angle $\angle$QOR.

OR

Find the value of $\angle$OQR.

iii. Is it true that points P, Q and R lie on the circle?

Chapter- Heron's Formula

Solve the following questions:

Q1. In ΔABC, AB = 6cm, BC = 7cm and AC = 5cm. 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. $10\sqrt{3}m^2$ b. $15\sqrt{3}m^2$ c. $20\sqrt{3}m^2$ d. $100\sqrt{3}m^2$

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. 28cm

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

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

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

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

Q7. An isosceles right triangle has area 8cm^2. The length of its hypotenuse is :

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

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

a. $48cm^2$ b. $40cm^2$ c. $24cm^2$ d. $80cm^2$

Q9. The edges of a triangular board are 6cm, 8cm and 10cm. 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 $16\sqrt{3}cm^2$, then the perimeter of the triangle is :

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

Q.11 Assertion (A): If the sides of ΔABC are a = 5cm, b= 6cm and c = 7cm, then area of ΔABC is $6\sqrt{6}cm^2$.

Reason (R): The area of triangle having sides a, b and c with semi-perimeter s is given by

$$\Delta = \sqrt{s(s-a)(s-b)(s-c)}$$

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. Assertion (A): If the area of an equilateral triangle is $49\sqrt{3}cm^2$, then the semi-perimeter of triangle is 42cm.

Reason (R): If a, b and c are the sides of a triangle, then semi-perimeter of a ΔABC is

$$s = \frac{a+b+c}{2}$$

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q13. The difference between the semi-perimeter and the sides of a ΔABC are 8cm, 7cm and 5cm respective. Find the area of ΔABC.

Q14. The semi-perimeter of a triangle is 132cm. The product of the difference of semi-perimeter and its respective sides is $13200cm^3$. Find the area of the triangle.

Q15. The perimeter of a triangle is 300cm and its sides are in the ratio 5 : 12 : 13. Find its area.

Q16. Find the percentage increase in the area of a triangle if its each side is doubled.

Q17. 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.

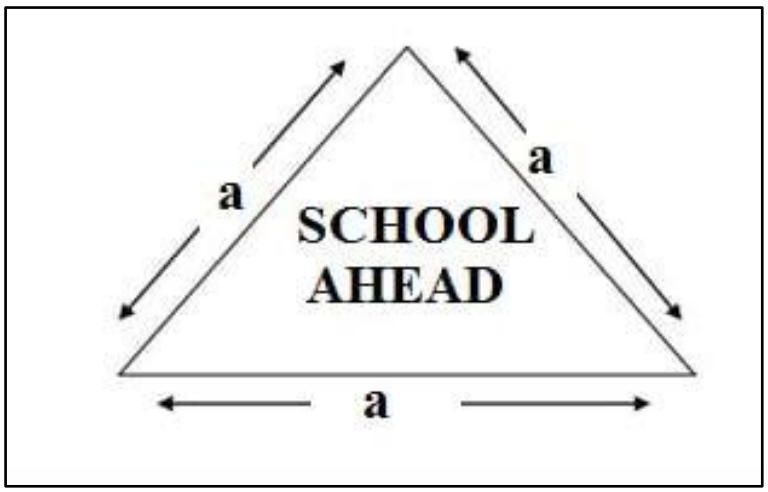
Q18. Find the cost of turfing a triangular field at the rate of Rs. $5/m^2$ having lengths of its sides as 40m, 70m and 90m. (Take $\sqrt{20} = 4.17$)

Q19. The sides of a triangular field are 24m, 7m and 25m. Find the numbers of triangular beds that can be made of sides 3m, 4m and 5m.

Case-study based question:

Q20. 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.

ii. Find the area of the triangle.

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

OR

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

Chapter- 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. 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. $16\pi\, cm^3$ b. $14\pi\, cm^3$ c. $12\pi\, cm^3$ d. $18\pi\, cm^3$

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 10.5cm, 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. $7356cm^3$ b. $7546cm^3$ c. $7506cm^3$ d. $7564cm^3$

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 ratio 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. Assertion (A): If the radius of a sphere is doubled then the ratio of the volume of the first sphere to that of the second is 1:8.

Reason (R): A cone and a hemisphere have equal bases and equal volumes. The ratio of their heights is 1: 2.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q12. Assertion (A): The curved surface area of a cone is $550cm^2$ and its diameter is 14cm. Then, its slant height is 25cm.

Reason (R): The curved surface area of a cone having base radius r and slant height l is πrl.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q13. The radius and the lateral surface area of a right circular cone are 8cm and 10cm^2 respectively. Find its slant height.

Q14. If the volume and the base area of a right circular cone are $48\pi\ cm^3$ and $12\pi\ cm^3$ respectively, then find the slant height of the cone.

Q15. Find the total surface area of a solid hemisphere with radius 7cm.

Q16. Find the surface area of a sphere whose diameter is d.

Q17. Write volume of a hemisphere in terms of surface area of the corresponding sphere.

Q18. 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.

Q19. Curved surface area of a cone is 154cm^2 and its slant height is 14cm. Find :

i. Radius of the base. ii. Total surface area of the cone.

Q20. The radius and height of a right circular cone are in the ratio 2:3. Find its slant height if its volume is 100.48cm^3. (take π = 3.14)

Q21. 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 100cm^2.

Q22. A boy has a spherical sweet of a radius 4cm. A girl has 8 spherical sweets each of radius 2cm. Find the ratio of the volume of the sweet the boy has to the sweet the girl has.

Q23. 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 $\pi = \frac{22}{7}$)

Q24. A shopkeeper has one spherical laddoo of radius 5cm. With the same amount of material, how many laddoos of radius 2.5cm can be made?

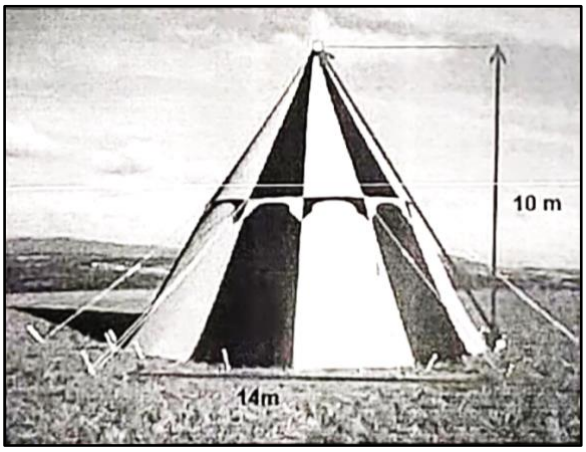
Q25. The floor area of a tent which is in the form of a right circular cone is $\frac{3168}{7} m^2$. The area of canvas required for making the tent is $\frac{3960}{7} m^2$. Find the air capacity of the tent.

Q26. The internal and external diameters of a hollow hemispherical vessel are 24cm and 25cm respectively. If the cost of painting 1cm^2 of the surface area is Rs. 0.05, find the total cost of painting the vessel all over.

Q27. The water for a factory is stored in a hemispherical tank whose internal diameter is 14m. The tank contains 50KL 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 question:

Q28. 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?

ii. What was the volume of the tent?

iii. What was the area of the floor?

OR

What was latent height of tent?

Chapter- Statistics

Solve the following questions:

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

a. bar graph
b. histogram
c. frequency polygon
d. cumulative 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. in between x and y - axis
d. both of x - axis 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. Assertion (A): In a histogram, the area of each rectangle is proportional to the class- size of the corresponding class-interval.

Reason (R): In a histogram, the area of each rectangle is proportional to the frequency of its class.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q6. Assertion (A): Frequency polygon is only obtained by joining the mid-points of upper horizontal sides of all rectangles in a histogram.
Reason (R): Frequency polygon of given frequency distribution can be drawn by using histogram or without using histograms.

a. Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).

b. Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).

c. Assertion (A) is true but Reason (R) is false.

d. Assertion (A) is false but Reason (R) is true.

Q7. 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?

Q8. 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.

Q9. Construct a histogram for the following data :

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

Q10. Construct a frequency polygon with histogram, for the following information :

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

Q11. 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.

Q12. 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

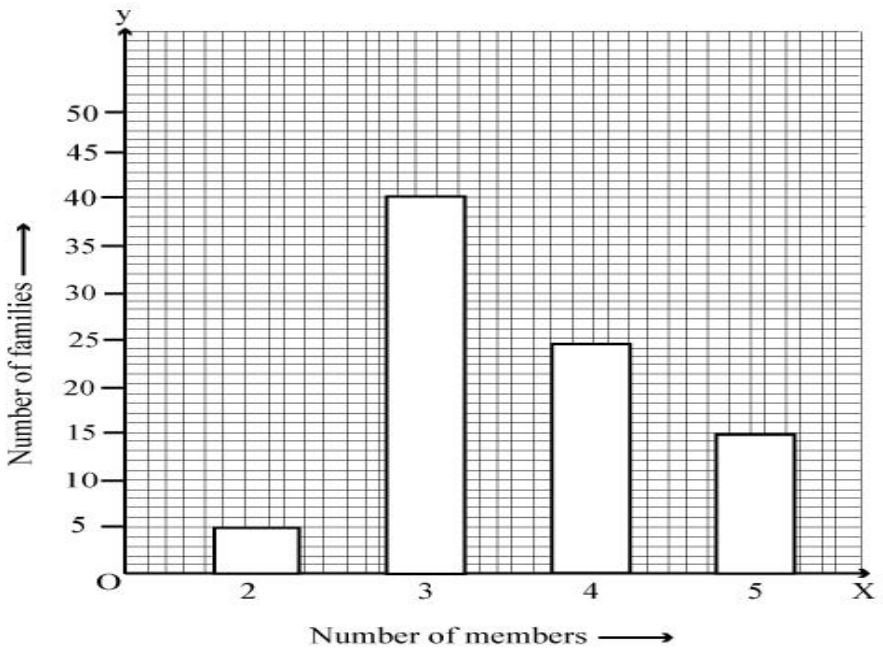
Q13. The monthly profit (in Rs.) of 100 shops are distributed as follows :

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 question:

Q14. 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?

ii. How many families have 2 members each?

iii. How many families have 5 members?

OR

Which type of family is most common?