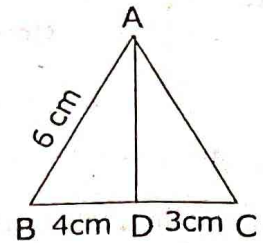


V10M

2

- 22) AD is the bisector of $\angle A$. If $BD = 4$ cm, $DC = 3$ cm and $AB = 6$ cm find AC.



- 23) Show that the points $P(-1.5, 3)$, $Q(6, -2)$, $R(-3, 4)$ are collinear.
 24) Find the slope of a line joining the points $(\sin\theta, -\cos\theta)$ and $(-\sin\theta, \cos\theta)$.
 25) Find the intercepts made by the line $4x - 9y + 36 = 0$ on the coordinate axes.

26) Prove that $\sqrt{\frac{1 + \cos\theta}{1 - \cos\theta}} = \operatorname{cosec}\theta + \cot\theta$.

27) Solve $5x \equiv 4 \pmod{6}$.

28) Simplify: $\frac{x}{x-y} + \frac{y}{y-x}$

III. Answer any 10 questions: [Q.No. 42 is compulsory]

10×5=50

- 29) Let $A = \{4, 5\}$, $B = \{0, 2\}$ and $C = \{2, 4\}$. Verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$
 30) If $f(x) = 2x + 3$, $g(x) = 1 - 2x$ and $h(x) = 3x$. Prove that $f \circ (g \circ h) = (f \circ g) \circ h$.
 31) If nine times ninth term is equal to the fifteen times fifteenth term, show that six times twenty fourth term is zero.
 32) Find the sum to n terms of the series $3 + 33 + 333 + \dots$ to n terms.
 33) Find the sum of the following series $21^2 + 22^2 + \dots + 30^2$.
 34) Find the GCD of the polynomials $x^3 + x^2 - x + 2$ and $2x^3 - 5x^2 + 5x - 3$.
 35) If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square, find the values of a and b .
 36) If one root of the equation $2y^2 - ay + 64 = 0$ is twice the other then find the values of a .
 37) State and prove: Thales theorem
 38) Find the area of quadrilateral, formed by the points $(8, 6)$, $(5, 11)$, $(-5, 12)$ and $(-4, 3)$.
 39) If the points $A(2, 2)$, $B(-2, -3)$, $C(1, -3)$ and $D(x, y)$ form a parallelogram then find the value of x and y .
 40) Find the equation of the perpendicular bisector of the line joining the points $A(-4, 2)$ and $B(6, -4)$.
 41) Prove that $\frac{\sin A}{1 + \cos A} + \frac{\sin A}{1 - \cos A} = 2 \operatorname{cosec} A$.
 42) A function f is defined by $f(x) = 2x - 3$.

i) find $\frac{f(0) + f(1)}{2}$

ii) find x such that $f(x) = 0$.

iii) find x such that $f(x) = x$

iv) find x such that $f(x) = f(1-x)$

IV. Answer the following:

2×8=16

- 43) Draw a triangle ABC of base $BC = 8$ cm, $\angle A = 60^\circ$ and the bisector of $\angle A$ meets BC at D such that $BD = 6$ cm.

(OR)

Construct a triangle similar to a given triangle PQR with its sides equal to

$\frac{7}{3}$ of the corresponding sides of the triangle PQR. (scale factor $\frac{7}{3} > 1$).

- 44) Draw the graph of $xy = 24$, $x, y > 0$. Using the graph find (i) y when $x = 3$ and (ii) x when $y = 6$.

(OR)

Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference (approximately related) of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.
