https://youtube.com/user/TheMuruganandham

2022 MAY - PUBLIC QUESTION PAPER &ANSWER
X – STD – MATHEMATICS

Time: 3.00 Hrs **Maximum Marks: 100**

Instructions: (1) check the question paper for fairness of printing. If there is any lack of fairness, inform the Hall Supervisor immediately.
(2) Use **Blue or Black** ink to write and underline and pencil to draw diagrams
Note: this question paper contains **four** parts.

PART – I (Marks: 14)

Note: (i) Answer all the 14 questions. **1 ×14=14**
(ii) Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer.

1. If the ordered pairs $(a+2, 4)$ and $(5, 2a+b)$ are equal then (a, b) is

   (1) $(2, -2)$ (2) (5, 1) (3) (2, 3) (4) $(3, -2)$

2. If the HCF of 65 and 117 is expressible in the form of 65m− 117, then the value of m is (1) 4 (2) 2 (3) 1 (4) 3

3. If t_n is the n^{th} term of an A.P., then $t_{8n} - t_n$ is :
   (a) $(8n-1)d$ $b)$ $(8n-2)d$ $c)$ $(7n-2)d$ (d) $7nd$

4. If $(x-6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k is

   (1) 3 (2) 5 (3) 6 (4) 8

5. Which of the following should be added to make $x^4 + 64$ a perfect square?

   (1) $4x^2$ (2) $16x^2$ (3) $8x^2$ (4) $-8x^2$

6. The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the X axis is

   (1) 0 (2) 1 (3) 0or 1 (4) 2

7. If Δ ABC is an isosceles triangle with ∠C = 90° and AC = 5 cm, then AB is

   (1) 2.5cm (2) 5cm (3) 10cm (4) $5\sqrt{2}$ cm

8. In a ΔABC, AD is the bisector of ∠BAC. If AB = 8 cm, BD = 6 cm and DC = 3 cm. The length of the side AC is

   (1) 6cm (2) 4cm (3) 3cm (4) 8cm

9. If (5, 7), (3, p) and (6, 6) are collinear, then the value of p is

(1) 3 (2) 6 (3) 9 (4) 12

10. The slope of the line which is perpendicular to line joining the points (0, 0) and (–8, 8) is (1) –1 (2) 1 (3) $\frac{1}{3}$ (4) -8

11. A tower is 60 m height. Its shadow is x metres shorter when the sun's altitude is 45°than when it has been 30°, then x is equal to

(1) 41.92 m (2) 43.92 m (3) 43 m (4) 45.6 m

12. If two solid hemispheres of same base radius r units are joined together along their bases, then curved surface area of this new solid is

(1)$4\pi r^2\ sq.units$ (2) $6\pi r^2\ sq.units$ (3) $3\pi r^2\ sq.units$ (4) $8\pi r^2\ sq.units$

13. If the radius of the cylinder is doubled, the new volume of the cylinder will be _____ times the original volume.

a)same b) 3 c) 4 d) 2

14. The probability of getting a job for a person is $\frac{x}{3}$. If the probability of not getting the job is $\frac{2}{3}$ then the value of x is

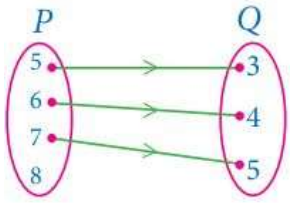
(1) 2 (2) 1 (3) 3 (4) 1.5

PART – II (Marks: 20)

II. Answer 10 Questions. Question No. 28 is compulsory. **10×2=20**

15. Let A = {1, 2, 3} and B = {x| x is a prime number less than 10}. Find A× B and B×A.

16. The arrow diagram shows (fig 1) a relationship between the sets P and Q. Write the relation in (i) set builder form (ii) Roster form (iii) what is the domain and range of R.



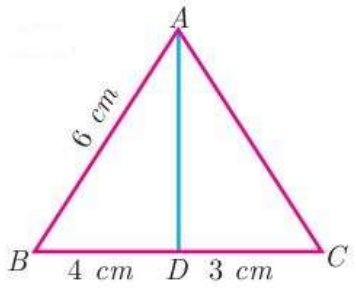
17. If 13824 23 = $2^a \times 3^b$ then find a and b.

18. Which term of an A.P. 16, 11, 6, 1, ... is -54

19. Find the excluded values of the following expressions (if any).

$$\frac{7p+2}{8p^2+3p+5}$$

20. In the Fig, AD is the bisector of ∠A. If BD = 4 cm, DC = 3 cm and AB = 6 cm, find AC.



21. Show that the points P$(-1.5,\ 3), Q(6,-2),\ R(-3,4)$ are collinear.

22. The line p passes through the points $(3,-2), (12,4)$ and the line q passes through the points $(6,-2) and\ (12,2)$. Is p parallel to q?

23. Find the equation of a straight line which has Slope $-\frac{5}{4}$ and passing through the point (–1,2).

24. From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.

25. The radius of a spherical balloon increases from 12 cm to 16 cm as air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.

26. The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3. Find the ratio of heights.

27. Two coins are tossed together. What is the probability of getting different faces on the coins?

28. $P = \frac{x}{x+y}$, $Q = \frac{y}{x+y}$, $then\ find\ \frac{1}{P^2-Q^2}$

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PART – III (Marks: 50)

III. Answer 10 Questions. Question No. 42 is compulsory. **10×5=50**

29. Let A = The set of all natural numbers less than 8, B = the set off all prime numbers less than 8,
C = the set of even prime number, verify that $A \times (B - C) = (A \times B) - (A \times C)$

30. If $l^{th}, m^{th}\ and\ n^{th}$ terms of an A.P. are x, y, z respectively, then show that

$(i)\ x(m-n) + y(n-l) + z(l-m) = 0$ $(ii)\ (x-y)n + (y-z)l + (z-x)m = 0$

31. The ratio of 6^{th} and 8^{th} term of an A.P. is 7:9. Find the ratio of 9^{th} term to 13^{th} term.

32. If $36x^4 - 60x^3 + 61x^2 - mx + n$ is a perfect square, find the values of m and n.
33. $solve\ \ pqx^2 - (p+q)^2x + (p+q)^2 = 0$
34. If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = -\frac{13}{7}$ Find the values of a.
35. Basic Proportionality Theorem (BPT) or Thales theorem
36. An aeroplane after take off from an airport, files due north at a speed of 1000 km/hr. at the same time, another aeroplane takes off from the same airport and flies due west at a speed of 1200 km/ hr. how far apart will be the two planes after $1\frac{1}{2}$ hours?
37. A quadrilateral has vertices A$(-4, -2)$, B$(5, -1)$, C$(6, 5)$ and D$(-7, 6)$. Show that the mid-points of its sides form a parallelogram.
38. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 30 m high building are45° and 60° respectively. Find the height of the tower. ($\sqrt{3}$ =1.732)
39. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs.40 per litre.
40. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model is 3cm and its length is 12cm. If each cone has a height of 2cm, find the volume of the model that Nathan made.
41. In a class of 50students, 28opted for NCC, 30opted for NSS and 18opted both NCC and NSS. One of the students is selected at random. Find the probability that (i) The student opted for NCC but not NSS.(ii) The student opted for NSS but not NCC.(iii) The student opted for exactly one of them.
42. Find the equation of the line passing through $(22, -6)$ and having intercept on x −axis exceeds the intercept on y −axis by 5 units.

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PART – IV (Marks: 16)

IV. Answer both questions. **2×8=16**

43. Construct a ΔABC such that AB = 5.5cm, ∠C = 25° and the altitude from C to AB is 4 cm. (or)
Draw the two tangents from a point which is 5cm away from the centre of a circle of diameter 6cm. Also, measure the lengths of the tangents.
44. Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$ (or)
Graph the following quadratic equations and state their nature of solutions.

$$x^2 - 4x + 4 = 0$$

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PART – I ANSWER KEYS

1. D) $(3, -2)$
2. (B) 2
3. D) 7nd
4. B) 5
5. B) 16 x^2
6. B) 1
7. D) $5\sqrt{2}\ cm$
8. B) 4 cm
9. C) 9
10. B) 1
11. B) 43.92 m
12. A) $4\pi r^2\ sq.units$
13.C) 4
14. B) 1

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PART – II 2 marks

15. Let A = {1, 2, 3} and B = {x| x is a prime number less than 10}. Find A× B and B×A.

Solution:

$A = \{1, 2, 3\}$ $B = \{2, 3, 5, 7\}$

$$A \times B = \{1, 2, 3\} \times \{2, 3, 5, 7\}$$

$$= \{(1, 2), (1, 3), (1,5), (1, 7), (2, 2), (2, 3), (2,5), (2, 7), (3, 2), (3, 3), (3,5), (3, 7),\}$$

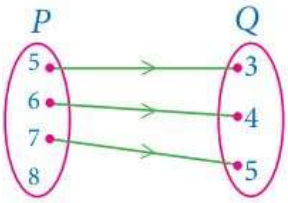
(1M)

$$B \times A = \{2, 3, 5, 7\} \times \{1, 2, 3\}$$

$$= \{(2,1), (2, 2), (2,3), (3,1), (3, 2), (3,3), (5,1), (5, 2), (5,3), (7,1), (7, 2), (7,3),\}$$

(1M)

16.



Set builder form of R = {(x, y) | $y = x - 2, x \in P,\ y \in Q$} **(1m)**

Roster form R = {(5, 3), (6, 4), (7, 5)} **(1m)**

17. $13824\ 23 = 2^a \times 3^b$

$$2^a \times 3^b = 2^9 \times 3^3 \qquad (\mathbf{1m})$$

$$a = 9, \quad b = 3 \qquad (\mathbf{1m})$$

18. Which term of an A.P. 16, 11, 6, 1, ... is -54

$$a = 16, \ t_n = -54, \ d = -5$$

$$n = \left(\frac{l-a}{d}\right) + 1 \qquad (\mathbf{1m})$$

$$n = 15, \qquad t_{15} = -54 \qquad (\mathbf{1m})$$

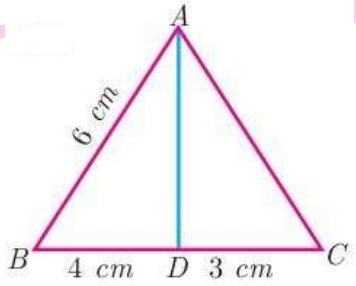
19. Find the excluded values of the following expressions (if any).

$$\frac{7p+2}{8p^2+3p+5}$$

$$8p^2 + 3p + 5 = (8p+5)(p+1) = 0 \qquad (\mathbf{1m})$$

$$P = -\frac{5}{8}, \qquad P = -1 \ \textit{The exculded values are} \ -\frac{5}{8}, \qquad -1 \qquad (\mathbf{1m})$$

20. In the Fig, AD is the bisector of ∠A. If BD = 4 cm, DC = 3 cm and AB = 6 cm, find AC.



$$\Delta ABC, \qquad By\ the\ ABT\ Theorem\ \frac{BD}{DC} = \frac{AB}{AC} \qquad (1M)$$

$$AC = 4.5\ cm \qquad (1m)$$

21. Show that the points $P(-1.5,\ 3), Q(6,-2),\ R(-3,4)$ are collinear.

$$\text{Area of } \Delta PQR = \frac{1}{2}\begin{bmatrix} x_1 & x_2 & x_3 & x_1 \\ y_1 & y_2 & y_3 & y_1 \end{bmatrix} \qquad (\mathbf{1m})$$

$$= \frac{1}{2}\ [18 - 18] = 0 \qquad (\mathbf{1m})$$

22. The line p passes through the points $(3,-2), (12,4)$ and the line q passes through the points $(6,-2) and\ (12,2)$. Is p parallel to q?

Slope $= \frac{y_2 - y_1}{x_2 - x_1}$

the slope of line p is $m_1 = \frac{2}{3}$

the slope of line q is $m_2 = \frac{2}{3}$ **(1m)**

$$m_1 = m_2 = \frac{2}{3} \quad parallel. \quad (\mathbf{1m})$$

23. Find the equation of a straight line which has Slope $-\frac{5}{4}$ and passing through the point (–1,2).

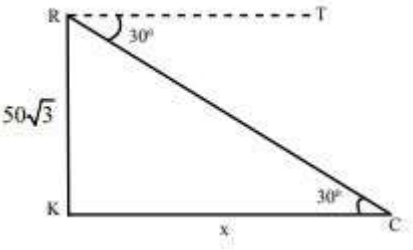
$$(x_1, y_1) = (-1,2). \quad \text{m} = -\frac{5}{4}$$

$$The\ equation\ of\ the\ point\ slope\ form$$

$$y - y_1 = m(x - x_1) \quad (\mathbf{1m})$$

$$5x + 7y + 13 = 0 \quad (\mathbf{1m})$$

24. From the top of a rock $50\sqrt{3}$ m high, the angle of depression of a car on the ground is observed to be 30°. Find the distance of the car from the rock.



(1m)

$$\tan 30° = \frac{RK}{KC}$$

$$\frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{x} \quad = x = 150m \qquad (\mathbf{1m})$$

25. The radius of a spherical balloon increases from 12 cm to 16 cm as air being pumped into it. Find the ratio of the surface area of the balloons in the two cases.

$$\frac{r_1}{r_2} = \frac{12}{16} = \frac{3}{4} \qquad (1m)$$

$$CSA\ of\ ballons = \frac{4\pi r_1}{4\pi r_2} = \left(\frac{r_1}{r_2}\right)^2 = \frac{9}{4} \qquad (1m)$$

26. The volumes of two cones of same base radius are 3600 cm^3 and 5040 cm^3. Find the ratio of heights.

Vol.of cone $= \frac{1}{3}\pi r^2 h$ **(1m)** Vol.of. cone 1 : vol of cone 2 = 3600 : 5040

$$\frac{\frac{1}{3}\pi r^2 h_1}{\frac{1}{3}\pi r^2 h_2} = \frac{180}{252} = \frac{45}{63}$$

$$\frac{h_1}{h_2} = \frac{5}{7} \qquad h_1 : h_2 = 5:7 \quad (\mathbf{1m})$$

27. Two coins are tossed together. What is the probability of getting different faces on the coins?

$$S = \{HH, HT, TH, TT\} \quad n(s) = 4$$
$$A = \{HT, TH\} \quad n(A) = 2 \quad (Both\ \mathbf{1m})$$
$$P(A) = \frac{1}{2} \qquad (\mathbf{1M})$$

28. $P = \frac{x}{x+y}$, $Q = \frac{y}{x+y}$, $then\ find\ \frac{1}{P^2-Q^2}$

$$P^2 = \left(\frac{x}{x+y}\right)^2, \quad Q^2 = \left(\frac{y}{x+y}\right)^2$$

$$= \frac{1}{P^2 - Q^2} = \frac{1}{\left(\frac{x}{x+y}\right)^2 - \left(\frac{y}{x+y}\right)^2} = \frac{1}{\frac{x^2}{(x+y)^2} - \frac{y^2}{(x+y)^2}}$$

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

$$= \frac{(x+y)^2}{(x+y)(x-y)} = \frac{x+y}{x-y}$$

PART – III

29. Let A = The set of all natural numbers less than 8, B = the set off all prime numbers less than 8,

C = the set of even prime number, verify that $A \times (B - C) = (A \times B) - (A \times C)$

$A \times (B - C)$

$= \{(1,3), (1,5), (1,7)(2,3), (2,5), (2,7), (3,3), (3,5), (3,7), (4,3), (4,5), (4,7), (5,3), (5,7), (6,3), (6,5), (6,7), (7,3), (7,5), (7,7)\}$ **(2.5 M)**

$(A \times B) - (A \times C)$

$= \{(1,3),(1,5),(1,7)(2,3),(2,5),(2,7),(3,3),(3,5),(3,7),(4,3),(4,5),(4,7),(5,3),(5,7),$
$(6,3),(6,5),(6,7),(7,3),(7,5),(7,7)\}$ **(2.5M)**

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30. If l^{th}, m^{th} *and* n^{th} terms of an A.P. are x, y, z respectively, then show that

$$(i)\ x(m-n)+y(n-l)+z(l-m)=0$$

$$(ii)\ (x-y)n+(y-z)l+(z-x)m=0$$

$$t_l = x, \qquad t_m = y, \ \ t_n = z$$

$$t_l = a+(l-1)d = x \ ---------(1)$$

$$t_m = a+(m-1)d = y \ ---------(2) \qquad (thrice\ 1m)$$

$$t_n = a+(n-1)d = z \ ---------(3)$$

$$x(m-n)+y(n-l)+z(l-m)=0 \ = a(0)+d(0)=0 \qquad (1.5m)$$

(ii) $(x-y)n+(y-z)l+(z-x)m=0$

$$equation\ 1-2\ and\ 2-3\ and\ 3-1$$

$$x-y=(l-m)d$$

$$y-z=(m-n)d$$

$$z-x=(n-l)d \quad (thrice\ 1m)$$

$$(x-y)n+(y-z)l+(z-x)m=0$$

$$=[ln-mn+lm-nl+nm-lm]d=0 \quad (1.5m)$$

31. The ratio of 6^{th} and 8^{th} term of an A.P. is 7:9. Find the ratio of 9^{th} term to 13^{th} term.

$$\frac{t_6}{t_8}=\frac{7}{9} \quad [t_n = a+(n-1)d] \quad (1m)$$

$$\frac{a+(6-1)d}{a+(8-1)d}=\frac{7}{9} \qquad (1m)$$

$$a=2d \qquad (1m)$$

To find $\frac{t_9}{t_{13}} = \frac{a+(9-1)d}{a+(13-1)d} = \frac{a+8d}{a+12d}$ $(1m)$

$$\frac{t_9}{t_{13}} = \frac{5}{7} \qquad t_9 : t_{13} = 5:7 \qquad (1m)$$

32. If $36x^4 - 60x^3 + 61x^2 - mx + n$ is a perfect square, find the values of m and n.

$6x^2 - 5x + 3$ (1m)

$36x^4 - 60x^3 + 61x^2 - mx + n$

$6x^2$ $36x^4$ (1m)

$12x^2 - 5x$ $-60x^3 + 61x^2$

$-60x^3 + 61x^2$ (1m)

$12x^2 - 10x + 3$ $36x^2 - mx + n$

$36x^2 - 30x + 9$ (1m)

$m = 30 \;\; n = 9$ $(1m)$

33. *solve* $pqx^2 - (p+q)^2 x + (p+q)^2 = 0$

$a = pq, \; b = -(p+q)^2, \quad c = (p+q)^2$ $(0.5m)$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \qquad (1m)$$

$$x = \frac{-[-(p+q)^2] \pm \sqrt{(-(p+q)^2)^2 - 4(pq)(p+q)^2}}{2pq} \qquad (1m)$$

$$x = \frac{(p+q)^2 \pm (p+q)(p-q)}{2pq} \qquad (0.5m)$$

$$x = \frac{p+q}{q}, \qquad \frac{p+q}{p} \qquad (2m)$$

34. If α, β are the roots of $7x^2 + ax + 2 = 0$ and if $\beta - \alpha = -\frac{13}{7}$ Find the values of a.

$7x^2 + ax + 2 = 0$ $\quad a = 7, \; b = a, \; c = 2$ $\quad (1m)$

$$\alpha + \beta = \frac{-b}{a} = \frac{-a}{7} \qquad \alpha\beta = \frac{2}{7} \qquad (2m)$$

$$(\beta-\alpha) = -\frac{13}{7} \qquad (\beta-\alpha)^2 = \left(-\frac{13}{7}\right)^2 (1m)$$

$$(\alpha-\beta)^2 - 4\alpha\beta \quad = \frac{169}{49} \qquad a = \pm 15 \quad (1m)$$

35. Basic Proportionality Theorem (BPT) or Thales theorem

Statement : a straight line drawn parallel to a side of triangle intersecting the other to sides, divides the sides in the same ratio. (1m)

To prove $\frac{AD}{DB} = \frac{AE}{EC}$ $Draw\ a\ line\ DE\ ||BC\ \ (1M)$

$$\frac{AB}{AD} = \frac{AC}{AE} \qquad \frac{AD+DB}{AD} = \frac{AE+EC}{AE} \qquad (1M)$$

$$1 + \frac{DB}{AD} = 1 + \frac{EC}{AE} \qquad \frac{DB}{AD} = \frac{EC}{AE}\ (Taking\ reciprocal) \qquad (1M)$$

$$\frac{AD}{DB} = \frac{AE}{EC} \quad (1m)$$

36. An aeroplane after take off from an airport, files due north at a speed of 1000 km/hr. at the same time, another aeroplane takes off from the same airport and flies due west at a speed of 1200 km/ hr. how far apart will be the two planes after $1\frac{1}{2}$ hours?

37. A quadrilateral has vertices A$(-4,-2)$, B$(5,-1)$, C$(6,5)$ and D$(-7,6)$. Show that the mid-points of its sides form a parallelogram.

$$Mid\ point\ of\ the\ side\ AB = p\left(\frac{1}{2}, \frac{-3}{2}\right)$$

$$Mid\ point\ of\ the\ side\ BC = Q\left(\frac{11}{2}, 2\right)$$

$$Mid\ point\ of\ the\ side\ CD = R\left(-\frac{1}{2}, \frac{11}{2}\right)$$

$$Mid\ point\ of\ the\ side\ DA = S\left(\frac{-11}{2}, \frac{2}{2}\right) \qquad (2M)$$

SLOPE OF opposite side

slope of PQ $= \frac{7}{10}$ slope of RS $= \frac{7}{10}$

$$\text{slope of QR} = -\frac{7}{12} = \text{slope of ps} \qquad (2m)$$

PQ = RS AND QR = PS Hence, mid-points of its sides form a parallelogram. (1m)

38. From a point on the ground, the angles of elevation of the bottom and top of a tower fixed at the top of a 30 m high building are45° and 60° respectively. Find the height of the tower. ($\sqrt{3}$ =1.732)

$\Delta\, CBP,$

$$\tan\theta = \frac{BC}{BP} \quad \tan 60° = \frac{AB + AC}{BP}$$

$$\sqrt{3} = \frac{30 + h}{30} \quad ----(1) \quad (1.5m)$$

$$\Delta\, ABP, \quad \tan\theta = \frac{AB}{BP} \quad \tan 45° = \frac{30}{BP}$$

$$BP = 30 \quad -----(2) \quad (1.5M)$$

Substituting 2 in 1 $\sqrt{3} = \frac{30+h}{30}$ $(1m)$ $h = 21.96m$ $(1m)$

39. A container open at the top is in the form of a frustum of a cone of height 16 cm with radii of its lower and upper ends are 8 cm and 20 cm respectively. Find the cost of milk which can completely fill a container at the rate of Rs.40 per litre.

Volume of frustum $= \frac{1}{3}\,\pi\, h\,(R^2 + r^2 + Rr)$

$R = 20,\ r = 8 \quad h = 16 \ (1.5m)$

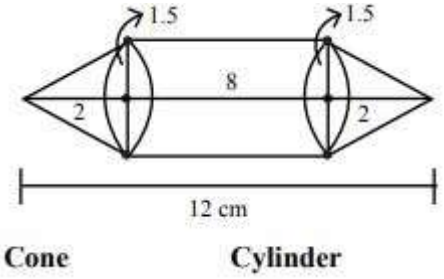
$$= \frac{73216}{7} = 10459.4\ cm^3 \ (1m)$$

$$volume\ of\ frustum = 10.4594\ litres \ (1m)$$

Required cost = 10. 4594 × 40 = $Rs.418.376$ $(1.5m)$

40. Nathan, an engineering student was asked to make a model shaped like a cylinder with two cones attached at its two ends. The diameter of the model

is 3cm and its length is 12cm. If each cone has a height of 2cm, find the volume of the model that Nathan made.



Volume of the model = volume of cylinder + 2 × volume of cone

$$= \pi r^2 h_1 + 2\,\frac{1}{3}\,\pi r^2 h_2$$

$$= \pi r^2 \left[h_1 + 2\,\frac{1}{3}\,h_2\right] \quad = 66\ cm^3$$

41. In a class of 50 students, 28 opted for NCC, 30opted for NSS and 18opted both NCC and NSS. One of the students is selected at random. Find the probability that (i) The student opted for NCC but not NSS.(ii) The student opted for NSS but not NCC.(iii) The student opted for exactly one of them.

$$n(A) = 28, \quad n(B) = 30, \quad n(A \cap B) = 18 \quad n(S) = 50$$

$$P(A) = \frac{28}{50} \quad P(B) = \frac{30}{50}, \qquad P(A \cap B) = \frac{18}{50} \qquad (1M)$$

(i) The student opted for NCC but not NSS

$$P(A \cap \bar{B}) = P(A) - \mathrm{P}(A \cap B) = \frac{28}{50} - \frac{18}{50} = \frac{1}{5} \qquad (1M)$$

(ii) The student opted for NSS but not NCC

$$P(\bar{A} \cap B) = P(B) - \mathrm{P}(A \cap B) = \frac{30}{50} - \frac{18}{50} = \frac{6}{25} \quad (1M)$$

(iii) The student opted for exactly one of them.

$$P(A \cap \bar{B}) U\ P(\bar{A} \cap B) = \frac{1}{5} + \frac{6}{25} = \frac{11}{25} \qquad (2M)$$

42. Find the equation of the line passing through $(22, -6)$ and having intercept on x −axis exceeds the intercept on y −axis by 5 units.

Equation of the line $= \frac{x}{a} + \frac{y}{b} = 1 \qquad \frac{x}{b+5} + \frac{y}{b} = 1 \qquad (1m)$

$$bx + (b+5)y = b(b+5) \qquad (x, y) = (22, -6\ ) \quad (1m)$$

$$22b + b + 5\,(-6) = b^2 + 5b$$

$$b^2 - 11b + 30 = 0 \qquad b = 6, 5 \quad (1m)$$

$b = 6\ becomes$

$$bx + (b+5)y = b(b+5) \;\; = 6x + 11y - 66 = 0 \quad (1m)$$

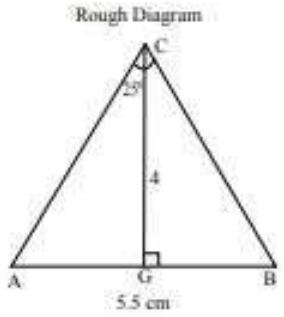
$b = 5\ becomes$

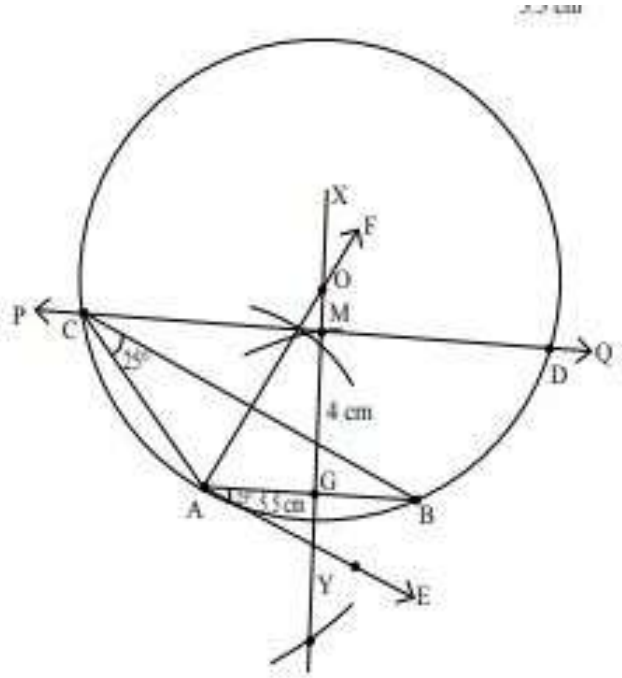
$$bx + (b+5)y = b(b+5) \;\; = \;\; x + 2y - 10 = 0 \quad (1m)$$

PART – IV (Marks: 16)

IV. Answer both questions. **2×8=16**

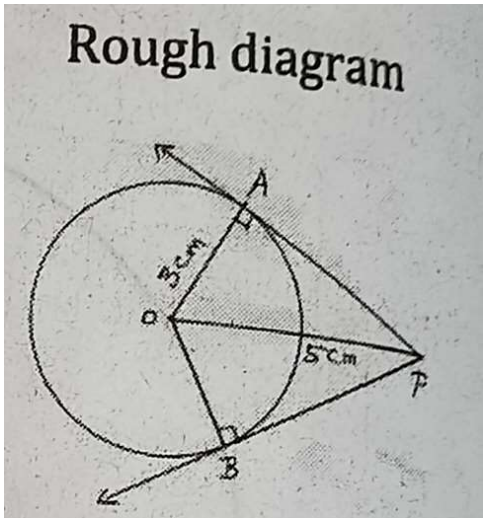
43. Construct a ΔABC such that AB = 5.5cm, ∠C = 25° and the altitude from C to AB is 4 cm.

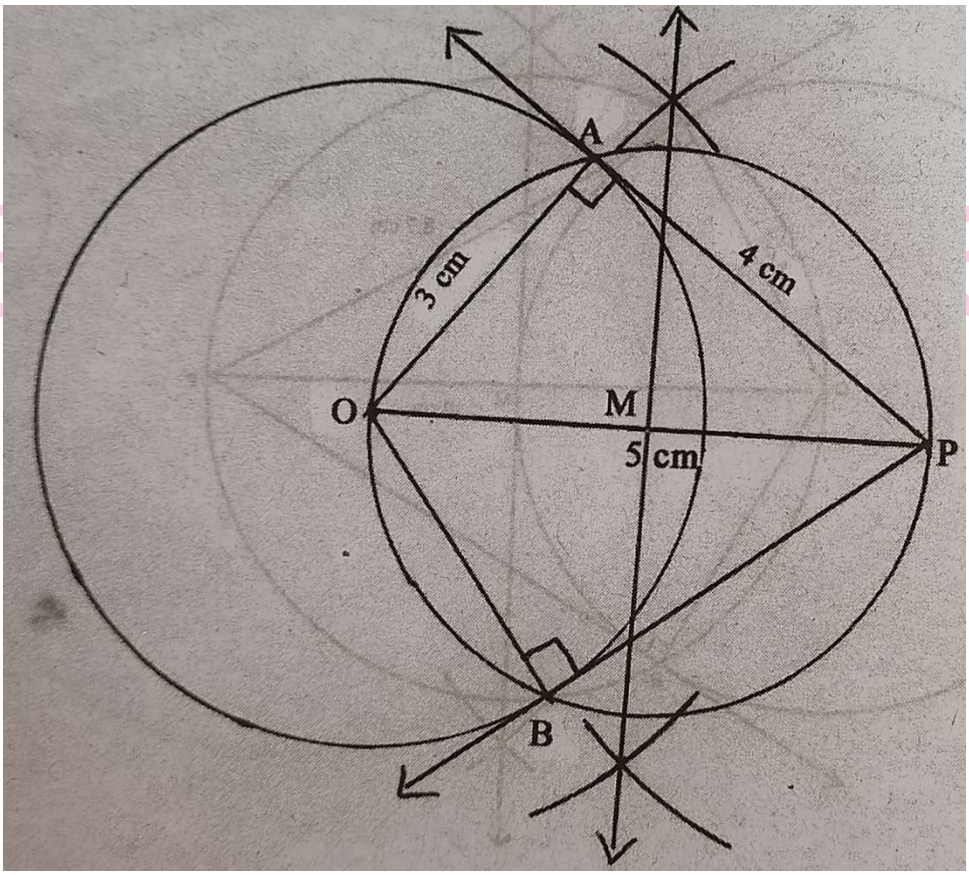




(or)

Draw the two tangents from a point which is 5cm away from the centre of a circle of diameter 6cm. Also, measure the lengths of the tangents.





44. Draw the graph of $y = x^2 - 4x + 3$ and use it to solve $x^2 - 6x + 9 = 0$

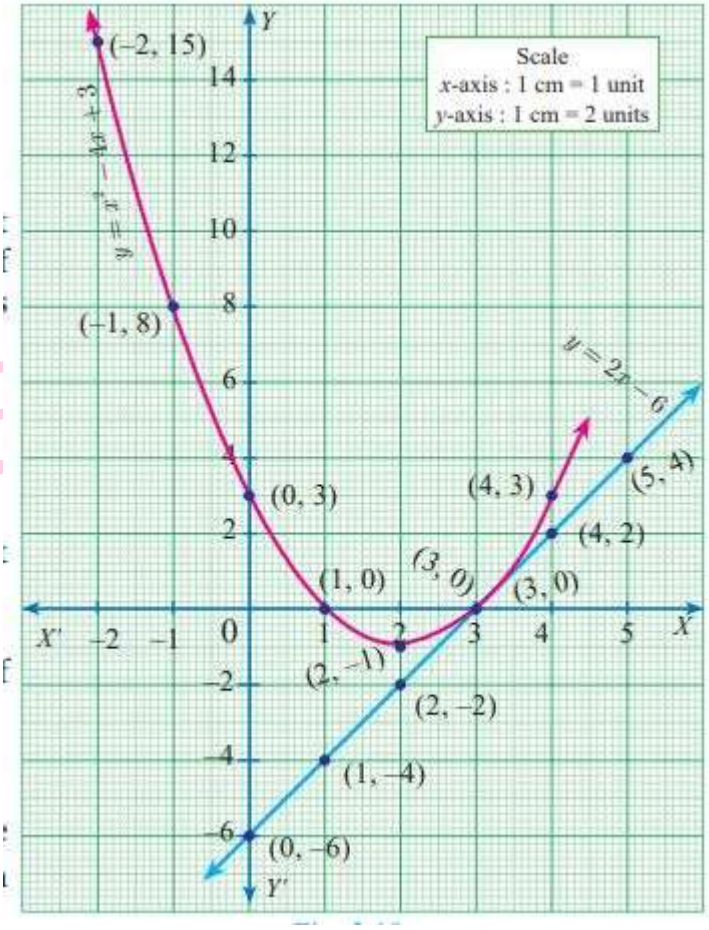
x	−2	−1	0	1	2	3	4
y	15	8	3	0	−1	0	3

$$y = x^2 - 4x + 3$$

$$0 = x^2 - 6x + 9$$

$$y = 2x - 6$$

x	0	1	2	3	4	5
y	−6	−4	−2	0	2	4



Solution : {3}

(or)

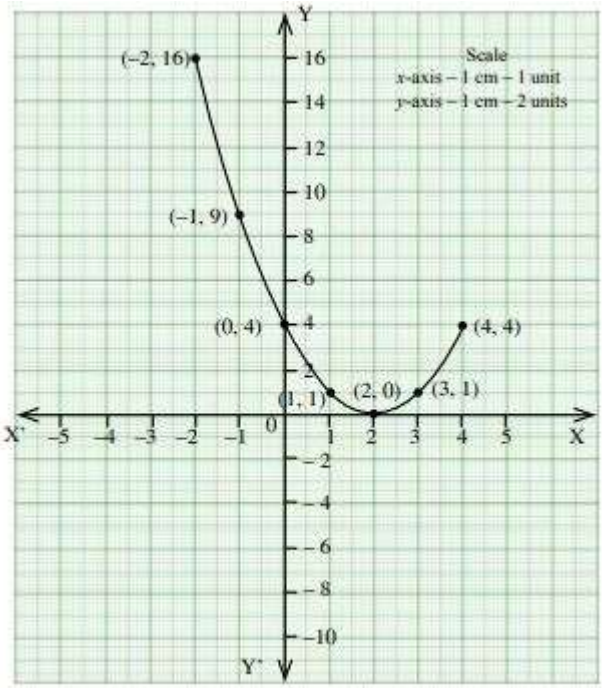
Graph the following quadratic equations and state their nature of solutions.

https://youtube.com/user/TheMuruganandham

$$x^2 - 4x + 4 = 0$$

Let $y = x^2 - 4x + 4$

x :	-2	-1	0	1	2	3	4
x^2 :	4	1	0	1	4	9	16
$-4x$:	8	4	0	-4	-8	-12	-16
4 :	4	4	4	4	4	4	4
$y = x^2 - 4x + 4$:	16	9	4	1	0	1	4



Solution : real and equal roots

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MY YOU TUBE CHANNEL LINK
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