ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ
ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
Malleshwaram, Bengaluru – 560 003

2024-25ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ-1
S.S.L.C. MODEL QUESTION PAPER-1 – 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : 81-E **Subject Code : 81-E**

ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು] [Time : 3 Hours 15 Minutes

ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**] [Max. Marks : **80**

General Instructions to the Candidate :

1. This question paper consists of 38 questions.
2. Follow the instructions given against the questions.
3. Figures in the right hand margin indicate maximum marks for the questions.
4. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

I. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The HCF of $5^2 \times 2$ and $2^5 \times 5$ is

(A) 2×5 (B) $2^5 \times 5$

(C) $5^2 \times 2^6$ (D) $2^5 \times 5^2$

2. The sum of first *'n'* natural numbers is

(A) $n\,(n+1)$ (B) $\frac{n\,(n+2)}{2}$

(C) $\frac{n\,(n+1)}{2}$ (D) $n\,(n-1)$

3. In a pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$, which of the following situations cannot arise ?

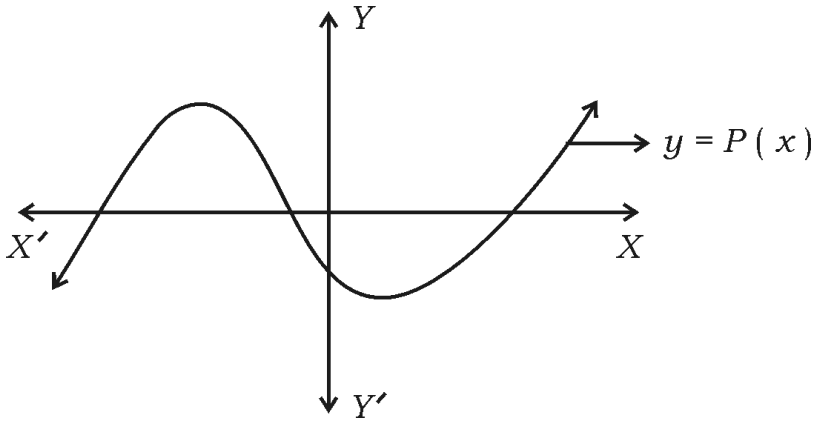
(A) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

(B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(C) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$

(D) $a_1 = a_2$, $b_1 = b_2$, $c_1 = c_2$

4. The number of zeroes of the polynomial $y = P(x)$ in the given graph is



(A) 2 (B) 3

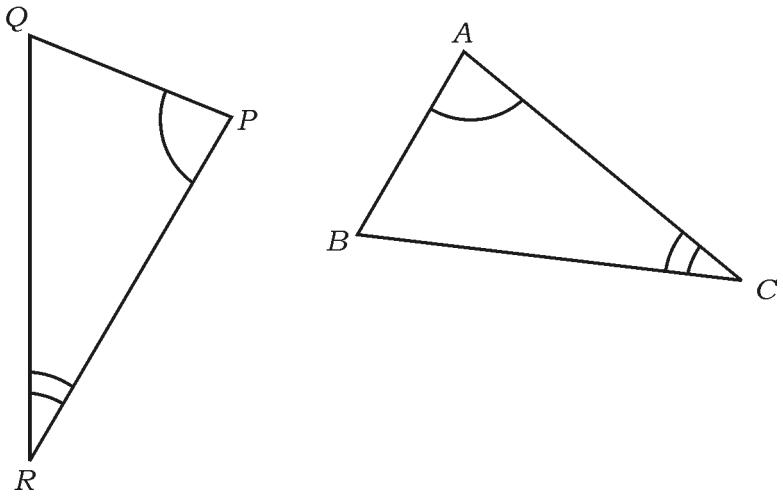
(C) 4 (D) 5

5. $x(x + 2) = 6$ is a

(A) linear equation (B) quadratic equation

(C) cubic polynomial (D) quadratic polynomial

6. In the figure, $\Delta PQR \sim \Delta ABC$. The pair of corresponding sides in the following is



(A) *PQ* and *AB* (B) *PR* and *AB*

(C) *QR* and *AC* (D) *PR* and *BC*

7. $\sin^2 A - \cos^2 A$ is equal to

(A) 1 (B) $1 - 2\cos^2 A$

(C) $1 + 2\cos^2 A$ (D) -1

8. The sum of the probability of all elementary events of a random experiment is

(A) 0 (B) $\frac{1}{2}$

(C) 1 (D) -1

II. Answer the following questions : **8 × 1 = 8**

9. Find the value of *'b'* if the pair of linear equations $2x + by = 8$ and $2(2x + 3y) = 16$ has infinite solutions.

10. Write the degree of the polynomial $P(x) = 5x^3 - 3x^2 + 12x - 8$.

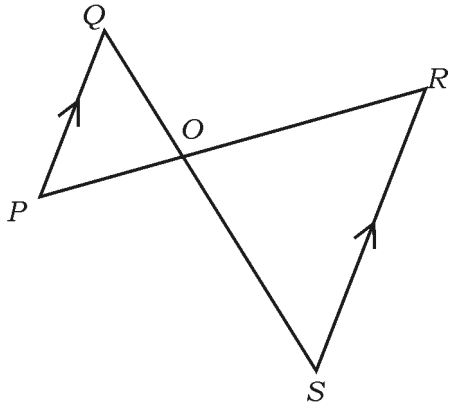
11. If $\sin A = \frac{\sqrt{3}}{2}$ and $\cos A = \frac{1}{2}$, then find the value of $\tan A$.

12. Write the empirical relation between the three measures of central tendency Mean, Median and Mode.

13. Express the quadratic equation $\frac{x+1}{2} = \frac{3}{x}$ in the standard form.

14. Find the distance of the point (6, 8) from the origin.

15. In the figure, $\Delta POQ \sim \Delta ROS$ and $PQ \parallel SR$. If $PQ : SR = 1 : 2$, then find $OS : OQ$.



16. The circumference of the circular base of a cylinder is 44 cm and its height is 10 cm. Find the curved surface area of the cylinder.

III. Answer the following questions : **8 × 2 = 16**

17. Prove that $3 + \sqrt{5}$ is an irrational number.

18. What is a composite number ? Which is the composite number among 23 and 24 ?

OR

State the fundamental theorem of arithmetic. Write the composite number which has 7 and 3 as its only prime factors.

19. Find the 21st term of the arithmetic progression 5, 9, 13, ... using formula.

20. Solve the pair of linear equations by elimination method :

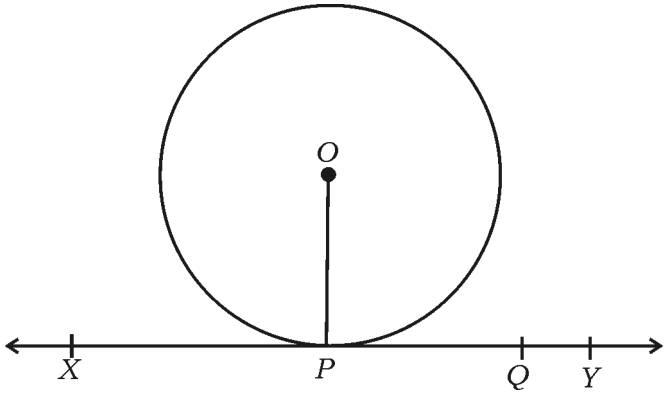
$x + y = 4$

$2x + y = 6$

21. If the quadratic equation $x^2 + bx + 9 = 0$ has two equal real roots, then find the equation ($b < 1$).

22. Find the coordinates of the point which divides the line segment joining the points A (1, -3) and B (8, 5) in the ratio 3 : 1 internally.

23. In the figure, XY is a tangent at the point P to a circle with centre O. Q is a point on XY. Show that $OQ > OP$.



24. A toy is in the form of a cone of radius 3·5 cm mounted on a hemisphere of same radius. The total height of the toy is 15·5 cm. Find the total surface area of the toy.

OR

The volume of a sphere is $\frac{539}{3}$ cm^3. Find its surface area.

IV. Answer the following questions : **9 × 3 = 27**

25. One of the zeroes of a polynomial $P(x) = x^2 - 5x + k$ is 1 more than the other zero. Find the value of k.

26. Find the two numbers whose sum is 27 and the product is 182.

OR

The altitude of a right angled triangle is 7 cm less than its base. If the hypotenuse is 13 cm, then find the other two sides.

27. Prove that

$(\sin A + \text{cosec } A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$.

28. Find a relation between x and y such that the point $P(x, y)$ is equidistant from the points $A(7, 1)$ and $B(3, 5)$. Also find the coordinates of the point P, if A, P and B are collinear.

OR

If the points $A(4, 5)$, $B(7, y)$, $C(4, 3)$ and $D(x, 2)$ are the vertices of a parallelogram, then find the values of x and y.

29. Find the mean for the following frequency distribution table :

Class interval	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency	2	3	5	7	3

OR

Find the median for the following frequency distribution table :

Class interval	15 – 20	20 – 25	25 – 30	30 – 35	35 – 40
Frequency	2	3	6	4	5

30. A boy and a girl are born in the month of September. Find the probability that both will have

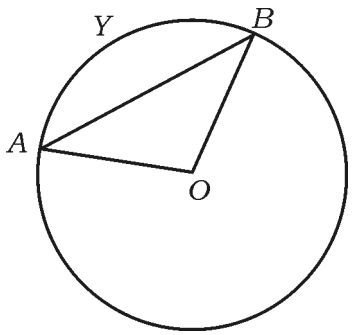
    i) different birthdays

    ii) the same birthday.

31. In a scalene triangle *ABC*, draw a line parallel to *BC*. Let this line intersect *AB* at *D* and *AC* at *E*. If *DE* : *BC* = 2 : 5, *AD* = 2 cm, *AE* = 3 cm and *DE* = 4 cm, then find the perimeter of the triangle *ABC*.

32. Prove that the lengths of tangents drawn from an external point to a circle are equal.

33. The area of the sector *OAYB* shown in the figure is 462 cm^2. Find the length of the arc *AYB* if $\angle AOB = 120°$.



OR

The area of the sector of a circle is numerically equal to the length of the arc of the same sector. If the length of the arc is $\frac{44}{21}$ cm, then find the radius of the circle and also the angle subtended by the arc at the centre.

V. Answer the following questions : 4 × 4 = 16

34. Find the solution of the given pair of linear equations by graphical method :

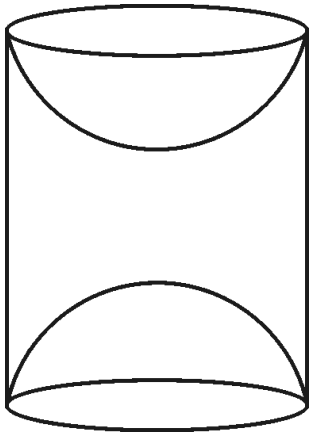
$x + y = 6$

$2x + y = 10$

35. The ratio of 11th and 8th terms of an arithmetic progression is 3 : 2. Find the ratio of the sum of the first 5 terms to the sum of the first 21 terms of it.

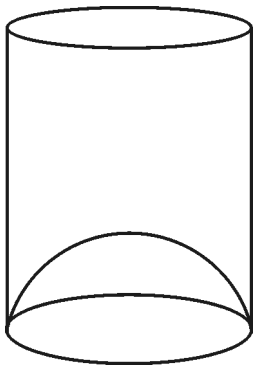
36. Prove that "If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio (or in proportion) and hence the two triangles are similar".

37. A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in the figure. If the height of the cylinder is 10 cm, and the radius of its base is 3·5 cm, then find the total surface area of the article.



OR

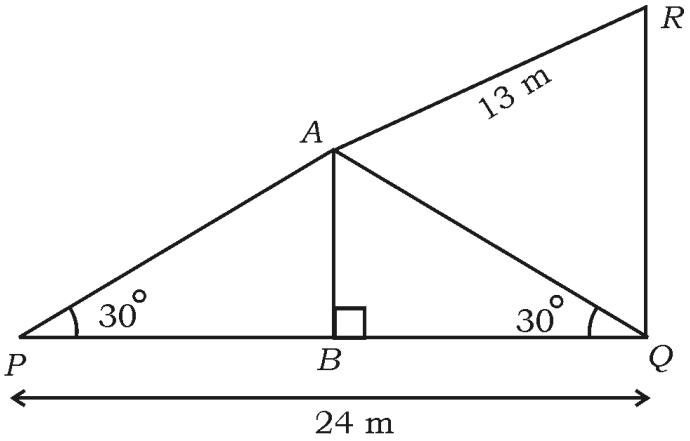
A juice seller was serving his customers using glass as shown in the figure. The inner diameter of the cylindrical glass was 5 cm, but the bottom of the glass had a hemispherical raised portion which reduced the capacity of the glass. If the height of the glass was 10 cm, then find the apparent capacity of the glass and its actual capacity. (Take $\pi = 3{\cdot}14$)



VI. Answer the following question : **1 × 5 = 5**

38. *AB* and *RQ* are two vertical towers standing on a level ground. The angle of elevation of the top of the tower from a point *P* on the same ground and from the foot of the tower *QR* are 30° as shown in the figure. If *PQ* = 24 m and *AR* = 13 m, then find the heights of the towers *AB* and *RQ*. Also find the length of *AP*.

(Take $\sqrt{3}$ = 1·7)



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S.S.L.C. MODEL QUESTION PAPER-2 – 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : 81-E **Subject Code : 81-E**

ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು] [Time : 3 Hours 15 Minutes

ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**] [Max. Marks : **80**

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3. Figures in the right hand margin indicate maximum marks for the questions.
4. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

I. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The number of tangents that can be drawn to a circle at the point on its circumference is

   (A) many (B) 3

   (C) 2 (D) 1

2. If *'a'* and *'b'* are two positive integers then the correct relation between HCF (*a, b*) and LCM (*a, b*) is

   (A) HCF (*a, b*) × LCM (*a, b*) = *a* – *b*

   (B) HCF (*a, b*) × LCM (*a, b*) = *a* × *b*

   (C) HCF (*a, b*) + LCM (*a, b*) = *a* + *b*

   (D) HCF (*a, b*) – LCM (*a, b*) = *a* × *b*

3. The number of solutions for a pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ when $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ is

   (A) 0 (B) 1

   (C) 2 (D) infinite

4. The n^{th} term of an arithmetic progression is $3n - 1$. Its 8^{th} term is

   (A) 25 (B) 10

   (C) 23 (D) 12

5. The maximum number of zeroes of a polynomial $P(x) = x^3 - 1$ is

(A) 3 (B) 0

(C) 1 (D) 2

6. The volume of a right circular based cylinder is 1540 cm^3 and its height is 10 cm. The area of its base is

(A) 15·4 cm (B) 15·4 cm^2

(C) 154 cm^2 (D) 154 cm^3

7. The formula to find the mean for the grouped data by direct method is, $\bar{x}$ =

(A) $\frac{\Sigma f_i x_i}{\Sigma f_i}$ (B) $\frac{\Sigma f_i + x_i}{\Sigma f_i}$

(C) $\frac{\Sigma f_i}{\Sigma f_i x_i}$ (D $\frac{\Sigma f_i - x_i}{\Sigma f_i}$

8. $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is equal to

(A) tan 90° (B) sin 45°

(C) cos 0° (D) sin 0°

II. Answer the following questions : **8 × 1 = 8**

9. Write the formula to find the sum of first n terms of an arithmetic progression whose first term is a and the last term is a_n.

10. Write the coordinates of the midpoint of the line segment joining the points $A(x_1, y_1)$ and $B(x_2, y_2)$.

11. The pair of linear equations $x + y - 4 = 0$ and $2x + by - 3 = 0$ have no solution. Find the value of *'b'*.

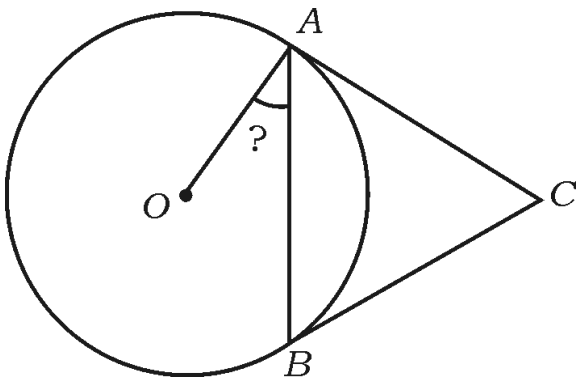
12. Find the maximum length of the rod to completely measure the rods of lengths 24 m and 36 m.

13. Write the formula to find the surface area of a sphere.

14. If one of the zeroes of the polynomial $P(x) = x^2 + 7x + k$ is 2, then find the value of *'k'*.

15. Find the value of the discriminant of the quadratic equation $x^2 + 4x + 4 = 0$.

16. In the figure, *'O'* is the centre of the circle and *CA* and *CB* are the tangents to the circle. If *AB* = *AC*, then find the measure of $\angle OAB$.



III. Answer the following questions : **8 × 2 = 16**

17. Find the sum of first 20 terms of the arithmetic progression 4, 7, 10, ... using formula.

18. Solve the given pair of linear equations by elimination method :

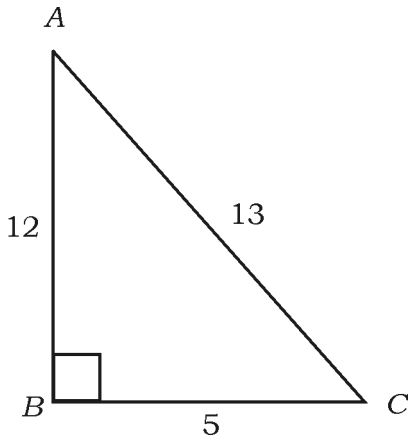
$2x + y = 8$

$x - y = 1$

OR

The difference between two positive numbers is 26 and if one number is three times the other then find the numbers.

19. In the figure, write the values of sin *C* and cos *A*.



20. Write the probability of

(i) a sure event

(ii) an impossible event.

21. Find the distance between the points (5, 6) and (1, 3) using distance formula.

22. A fair coin is tossed twice. Find the probability of getting at least one head.

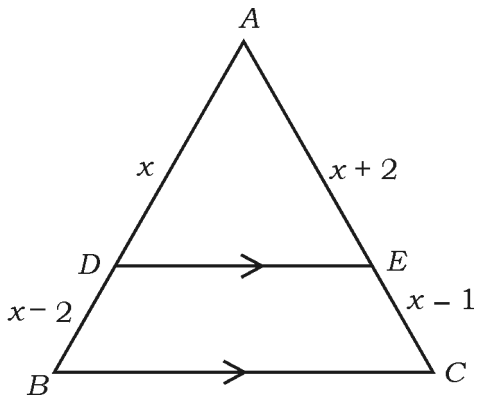
23. Solve the quadratic equation $x^2 + 3x + 2 = 0$ by the method of factorization.

OR

Find the value of *'k'* for which the quadratic equation $2x^2 + kx + 3 = 0$ has real equal roots.

24. In triangle *ABC*, *DE* || *BC*. *AD* = *x*, *BD* = *x* – 2, *AE* = *x* + 2 and *CE* = *x* – 1.

Find the value of *x* and hence find *AD* : *DB*.



IV. Answer the following questions : **9 × 3 = 27**

25. Prove that $\sqrt{3}$ is an irrational number.

26. Find the zeroes of the quadratic polynomial $P(x) = x^2 + 7x + 10$ and verify the relationship between the zeroes and the coefficients.

27. Calculate the mode for the following data :

Class interval	0-4	4-8	8-12	12-16	16-20	20-24
Frequency	7	3	7	10	1	2

OR

Calculate the median for the following grouped data :

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	2	4	8	5	1

28. Prove that $\sqrt{\frac{1-\cos A}{1+\cos A}} + \sqrt{\frac{1+\cos A}{1-\cos A}} = 2 \text{ cosec } A.$

OR

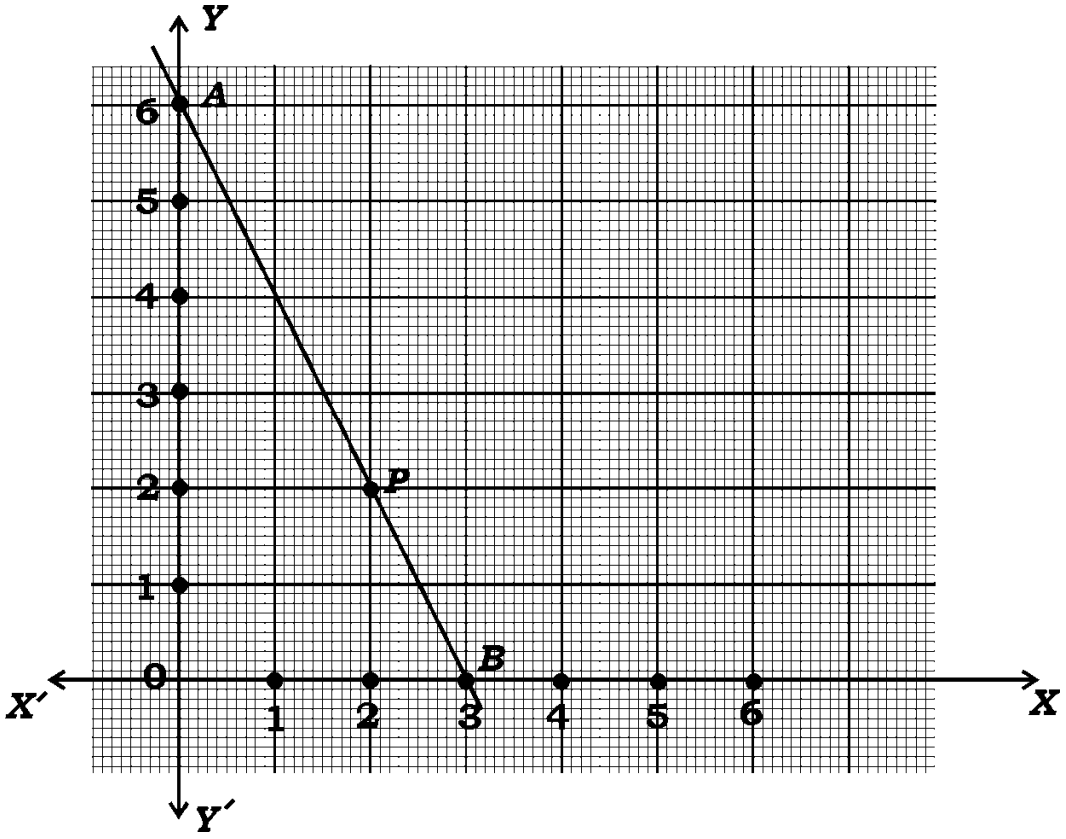
Prove that $\frac{1}{\sec A - 1} + \frac{1}{\sec A + 1} = 2 \text{ cosec } A \text{ . cot } A$

29. The length of the minute hand in a clock is 14 cm. Find the area swept by the minute hand in 10 minutes.

OR

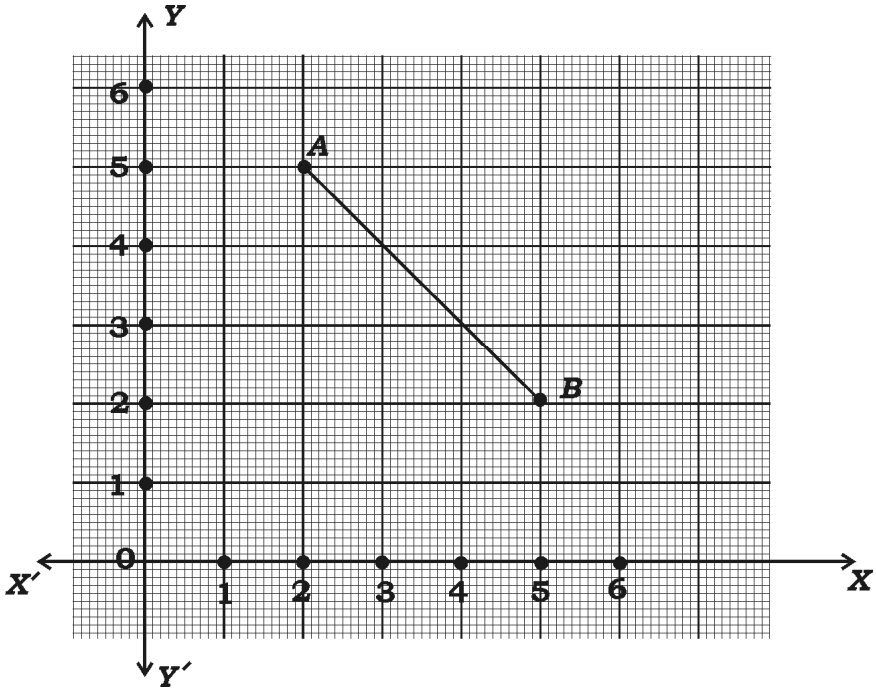
Find the area of the quadrant of a circle whose radius is 20 cm and also find the perimeter of the quadrant.

30. In the figure, find the ratio in which the point *'P'* divides the line segment *AB* using formula.



OR

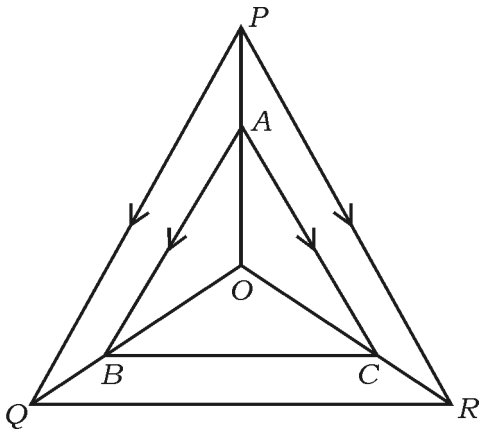
Find the coordinates of the point which divides the line segment *AB* given in the figure, internally in the ratio 1 : 2 using section formula.



31. Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact".

32. A student bought some books for Rs. 60. Had he bought 5 more books for the same amount each book would have cost Re. 1 less. Then find the number of books bought by him.

33. In the figure *A, B* and *C* are the points on *OP, OQ* and *OC* respectively. If *AB* || *PQ* and *AC* || *PR*, then show that *BC* || *QR*.



V. Answer the following questions : **4 × 4 = 16**

34. The 8th term of an arithmetic progression is half of its second term and 11th term of the progression exceeds one third of its 4th term by 1. Find the 15th term of the progression.

OR

An arithmetic progression consists of 37 terms. If the sum of its 3 middle terms is 225 and sum of its last 3 terms is 429, then find the progression.

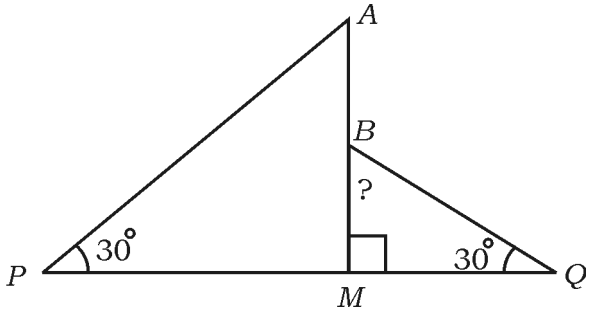
35. Solve the given pair of linear equations by graphical method :

$2x + y = 6$

$x + y = 4$

36. "If one angle of a triangle is equal to one angle of the other triangle and the sides including these angles are proportional then prove that the two triangles are similar."

37. A rope is tied from the tip of a vertical pole of length 37 m to a peg on a level ground. Another rope is tied to the same pole little below from its tip to a peg on the ground opposite to it as shown in the figure. Each rope is making an angle 30° with the ground. If the difference of the lengths of the ropes is 8 m, then find the height of the pole at which the shorter rope is tied. Also find the lengths of the ropes.

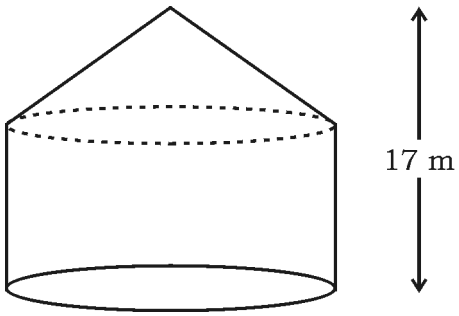


VI. Answer the following question : **1 × 5 = 5**

38. The tent of a circus company is built by canvas cloth such that a cone is surmounted on the cylindrical shape. If the height of the cylindrical shape is 9 m, the diameter of the base of the tent is 30 m and the total height of the tent is 17 m, then find the —

(a) area of the ground occupied by the tent

(b) area of the canvas cloth used for building the tent.



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2024-25ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ-3
S.S.L.C. MODEL QUESTION PAPER-3 – 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : 81-E **Subject Code : 81-E**

ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು] [Time : 3 Hours 15 Minutes

ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**] [Max. Marks : **80**

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2. Follow the instructions given against the questions.

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4. The maximum time to answer the paper is given at the top of the question paper.

   It includes 15 minutes for reading the question paper.

I. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The product of prime factors of 90 is

(A) 9×10 (B) 6×15

(C) $2 \times 3 \times 3 \times 5$ (D) $1 \times 2 \times 3 \times 15$

2. If the lines represented by the linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are parallel lines then

(A) $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$ (B) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$

(C) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ (D) $\frac{a_1}{a_2} = \frac{b_2}{b_1}$

3. If the graph of a quadratic polynomial passes through the coordinate points $(-3, 0)$, $(-1, -5)$, $(0, -6)$ and $(2, 0)$ then the zeroes of the quadratic polynomial are

(A) -3 and -6 (B) 0 and -3

(C) -1 and -5 (D) -3 and 2

4. In an A.P. if $a_n = 2n - 1$ then the common difference is

(A) 2 (B) – 2

(C) 3 (D) – 1

5. The coordinates of the midpoint of the line segment joining the points (– 4, 2) and (– 2, 6) are

(A) (3, 2) (B) (– 3, 4)

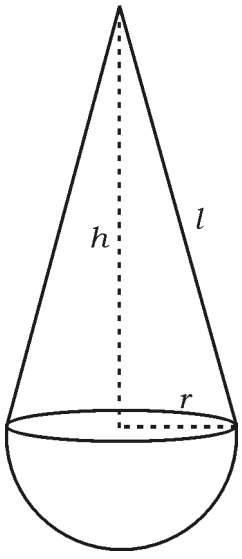
(C) (– 2, 3) (D) (– 4, 1)

6. If $\tan\theta = 1$ then value of $\sec\theta$ is

(A) $\frac{1}{\sqrt{3}}$ (B) 3

(C) $\sqrt{2}$ (D) $\frac{1}{\sqrt{2}}$

7. In the figure, A toy is made up of a cone mounted on a hemisphere as shown in the figure. Then the formula to find out the volume of the toy is



(A) $\pi r^3 + \pi rl$ (B) $3\pi r^2 + \pi r^2 h$

(C) $\frac{1}{3}\pi r^2 h + \frac{2}{3}\pi r^3$ (D) $\pi r^2 h + \frac{2}{3}\pi r^3$

8. If the probability of losing a game of a kabaddi team is 0·25 then the probability of winning in the same game is

(A) 0·95 (B) 0·75

(C) 9·75 (D) 0·70

II. Answer the following questions : **8 × 1 = 8**

9. Write the H.C.F. of 7 and 12.

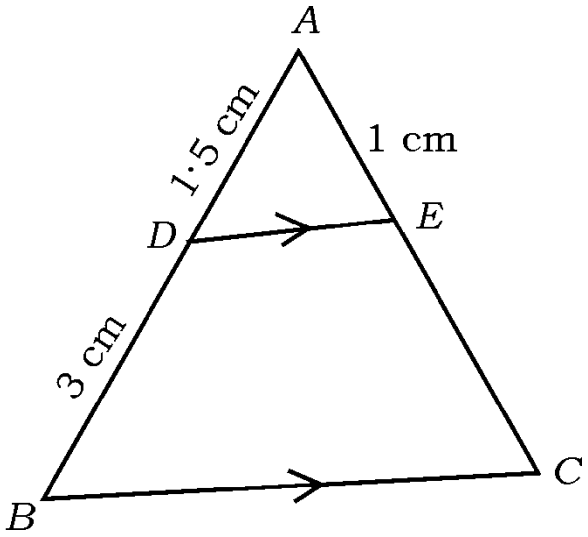
10. Write the general form of a quadratic polynomial where *a, b* and *c* are real numbers and *'x'* is a variable.

11. Write the formula to find the area of a quadrant of a circle.

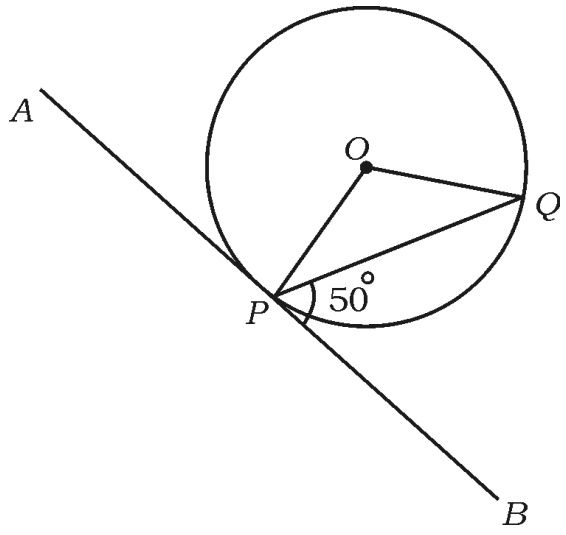
12. Write the formula to find the volume of a cylinder whose radius is *'r'* and height is *'h'*.

13. What does *'l'* represent in the formula, Median = $l + \left[\frac{\frac{n}{2} - cf}{f} \right] \times h$.

14. In the following figure, *ABC* is a triangle in which *DE* || *BC*, *AD* = 1·5 cm, *BD* = 3 cm, *AE* = 1 cm ; then find the value of *EC*.



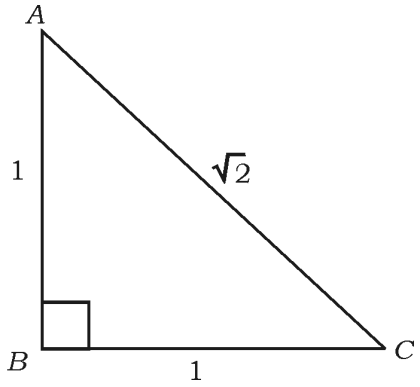
15. In the following figure, *'O'* is the centre of circle and *AB* is tangent at *P*. If $\angle BPQ = 50°$, find the value of $\angle POQ$ is



16. Find the class mark in the class interval 10 – 25.

III. Answer the following questions : **8 × 2 = 16**

17. In the given figure, find the value of cos *A* and cosec *C*.



18. Solve :

$2x + y = 8$

$3x - y = 7$

19. Find how many two digit numbers are divisible by 5 using formula.

OR

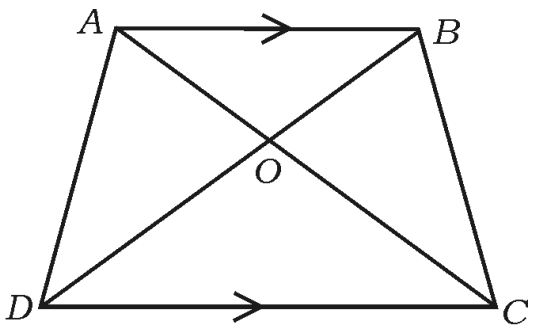
An arithmetic progression consists of 20 terms whose first and last terms are 12 and 106 respectively. Find the sum of the progression.

20. Solve $x - \frac{3}{x} = 2$

21. Find the coordinates of the point which divides the join of (1, 6) and (4, 3) in the ratio 1 : 2.

22. A bag contains some cards of consecutive natural numbers from 1. If the probability of drawing an even natural number card is $\frac{4}{9}$ then find the probability of getting a prime number card.

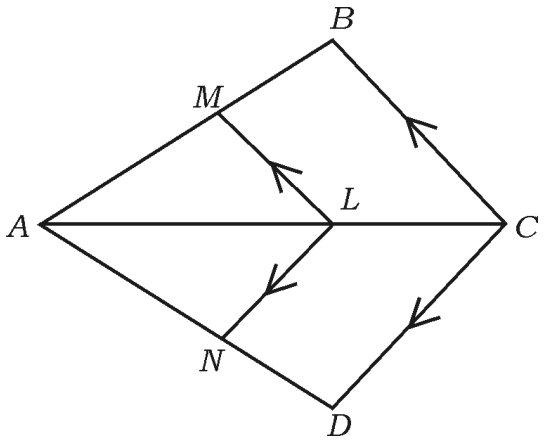
23. In the given figure *ABCD* is a trapezium in which $AB \parallel DC$ and its diagonals intersect each other at *'O'*. Show that $\frac{AO}{BO} = \frac{CO}{DO}$.



OR

In the given figure $LM \parallel CB$ and $LN \parallel CD$. Prove that

$\frac{AM}{AB} = \frac{AN}{AD}$.



24. Find the value of the discriminant of the quadratic equation

$3x^2 - 7x + 4 = 0$ and also write the nature of the roots.

IV. Answer the following questions : **9 × 3 = 27**

25. Prove that $\sqrt{5}$ is an irrational number.

26. If the zeroes of a quadratic polynomial are – 3 and 4 respectively then find the quadratic polynomial and also verify the relationship between zeroes and the coefficients.

OR

α and β are the zeroes of a quadratic polynomial. If $\alpha + \beta = -3$ and $\alpha\beta = 2$ then find the quadratic polynomial and also find the value of $(\alpha - \beta)$.

27. Find the value of $\dfrac{5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ}$.

OR

Prove that $\dfrac{1 + \sec A}{\sec A} = \dfrac{\sin^2 A}{1 - \cos A}$.

28. Find the area of the rhombus *ABCD* whose coordinates of the vertices are *A* (2, 4), *C* (8, 12) and length of *BD* is 5 units.

29. Find the mean of the following data :

Class interval	5–15	15–25	25–35	35–45	45–55	55–66
Frequency	6	11	21	23	14	5

OR

Find the mode of the following data :

Class interval	0–20	20–40	40–60	60–80	80–100	100–120
Frequency	10	35	52	61	38	29

30. If D is a point on the side BC of a triangle ABC, such that $\angle ADC = \angle BAC$, show that $CA^2 = CB \cdot CD$.

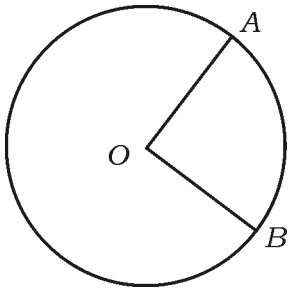
31. Prove that "The lengths of tangents drawn from an external point to a circle are equal".

32. Age of father is 30 years more than his son. After 5 years, the product of their ages is 400. Find the present ages of both the son and father.

OR

The first number is 3 more than second number. The sum of their squares is 29. Find the numbers.

33. In the figure *'O'* is the centre of the circle. Area of a sector *AOB* : Area of the circle = 1 : 5 and if the radius of the circle is 7 cm then find the length of the arc *AB*.



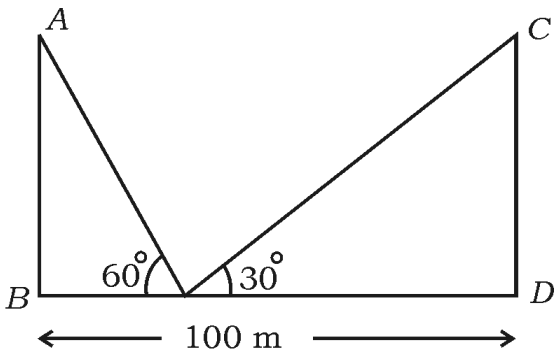
V. Answer the following questions : **4 × 4 = 16**

34. Solve the following pair of linear equations in two variables by graphical method :

$x + 2y = 8$

$x + y = 5$

35. Two poles of equal heights are standing vertically on a horizontal ground as shown in the figure. Wires are tied from top of the poles to a peg on the ground. The angles of elevations to the top of the poles are found to be 30° and 60°. If the distance between the feet of poles is 100 m, find the height of the poles and the length of wires.



36. Prove that, if in two triangles sides of one triangle are proportional to the sides of the other triangle, then their corresponding angles are equal and hence the two triangles are similar.

37. A sphere of volume 38808 cm^3 is divided into two equal parts. Find the total surface area of each hemisphere.

OR

A toy is made up of a cylinder having diameter 10 cm and height 20 cm and it is joined with a hemisphere of same diameter at one end and a cone of equal diameter and slant height 13 cm at the other end. Find the surface area of the toy.

VI. Answer the following question : 1 × 5 = 5

38. If the sum of *'n'* terms of an A.P. is $5n - n^2$ then write the arithmetic progression. Also find the 21st term and sum of the first 21 terms of the progression.

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ
ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD
Malleshwaram, Bengaluru – 560 003

2024-25ರ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ-4
S.S.L.C. MODEL QUESTION PAPER-4 – 2024-25

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಆಂಗ್ಲ ಮಾಧ್ಯಮ / English Medium)

ವಿಷಯ ಸಂಕೇತ : 81-E **Subject Code : 81-E**

ಸಮಯ : 3 ಗಂಟೆ 15 ನಿಮಿಷಗಳು] [Time : 3 Hours 15 Minutes

ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**] [Max. Marks : **80**

General Instructions to the Candidate :

1. This question paper consists of 38 questions.

2. Follow the instructions given against the questions.

3. Figures in the right hand margin indicate maximum marks for the questions.

4. The maximum time to answer the paper is given at the top of the question paper.

   It includes 15 minutes for reading the question paper.

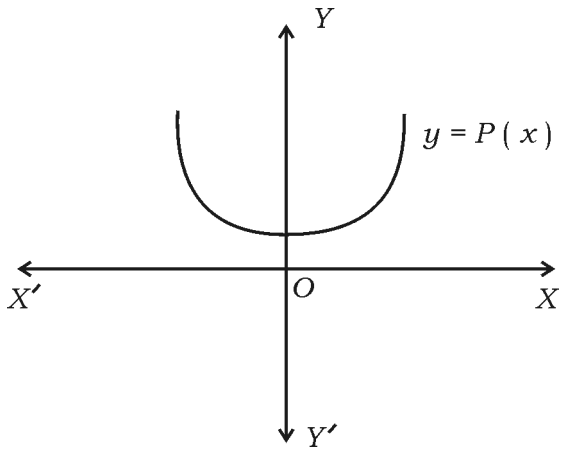
I. ***Four*** **alternatives are given for each of the following questions / incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet.** **8 × 1 = 8**

1. The rational number in the following is,

(A) $\sqrt{3}$ (B) $\sqrt{5}$

(C) $\sqrt{4}$ (D) $\sqrt{7}$

2. In the figure, graph of $y = P(x)$ is given. The number of zeroes of $P(x)$ is



(A) 0 (B) 1

(C) 2 (D) 3

3. The pair of linear equations represents parallel lines. If one of the equations is $2x + 3y - 8 = 0$, then the other equation is

(A) $4x + 6y - 9 = 0$ (B) $9x + 3y + 12 = 0$

(C) $18x + 6y + 24 = 0$ (D) $2x - y + 9 = 0$

4. The standard form of the quadratic equation is

(A) $ax^2 + bx = 0$ (B) $ax^2 - bx = c$

(C) $ax^2 + bx + c = 0$ (D) $ax^3 + bx + c = 0$

5. The distance between the points $A\ (x_1\ ,\ y_1)$ and $B\ (x_2\ ,\ y_2)$ is

(A) $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

(B) $\sqrt{(x_2 + x_1)^2 - (y_2 + y_1)^2}$

(C) $\sqrt{(x_1 + x_2) + (y_2 + y_1)}$

(D) $\sqrt{x^2 + y^2}$.

6. The formula to calculate the n^{th} term of an arithmetic progression is

(A) $a_n = a + (n - 1)\ d$

(B) $a_n = a - (n - 1)\ d$

(C) $a_n = a + (n + 1)\ d$

(D) $a_n = a + (n - 1)$

7. The formula to find the mean of given data by step-deviation method is

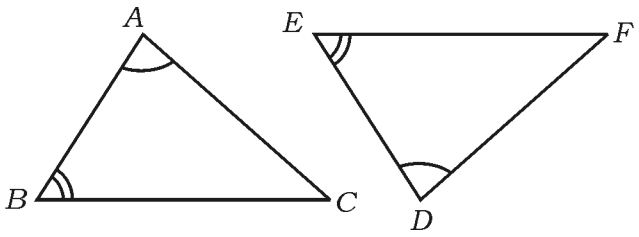
(A) $\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$

(B) $\overline{X} = a + \left[\frac{\sum f_i u_i}{\sum f_i} \right] h$

(C) $\overline{X} = a + \frac{\sum f_i u_i}{\sum f_i}$

(D) $\overline{X} = a - \left[\frac{\sum f_i u_i}{\sum f_i} \right] h$

8. $\Delta ABC \sim \Delta DEF$. Which one of the following relations is correct ?



(A) $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

(B) $\frac{AB}{DF} = \frac{BC}{EF} = \frac{AC}{DE}$

(C) $\frac{AB}{BC} = \frac{DE}{EF} = \frac{DF}{AC}$

(D) $\frac{AB}{AC} = \frac{DE}{EF} = \frac{BC}{DF}$

II. Answer the following questions : **8 × 1 = 8**

9. Write the HCF of any two prime numbers.

10. Write the degree of a cubic polynomial.

11. Write the number of solutions that the pair of linear equations

$2x - 5y + 4 = 0$ and $2x + y - 8 = 0$ have.

12. Write the nature of roots of the quadratic equation $x^2 - 9 = 0$.

13. Find the coordinates of the midpoint of the line segment joining the points $A(5, 4)$ and $B(1, 4)$.

14. Write the value of $\sin^2 90°$.

15. If E is an event related to probability, then write the value of $P(E) + P(\overline{E})$.

16. In the frequency distribution of data, if Mean is 25 and Median is 40, then calculate the value of Mode.

III. Answer the following questions : **8 × 2 = 16**

17. Calculate the sum of first 20 terms of an arithmetic progression 3, 5, 7, ... using formula.

18. Solve the given pair of linear equations $x + y = 8$ and $x - y = 2$.

19. Find the roots of the quadratic equation $x^2 + 4x - 60 = 0$.

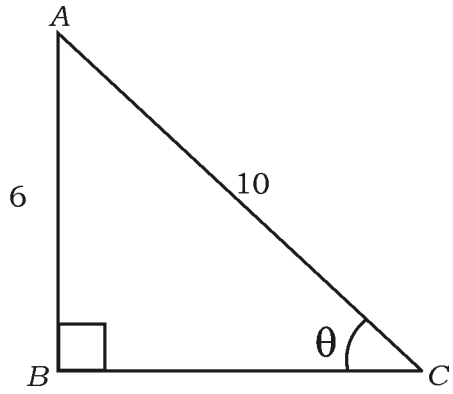
20. Find the value of '*x*', if the distance between the points (3, 1) and (0, *x*) is 5 units.

OR

A circle passes through the point (– 7, 1). If the centre of circle is (– 5, 4), then find the radius of the circle.

21. The coordinates of the point of trisection of the line joining the points *A* (2, – 2) and *B* (– 7, 4) is *P* (*x*, *y*). Find the value of *x* and *y*.

22. In the figure, find the values of

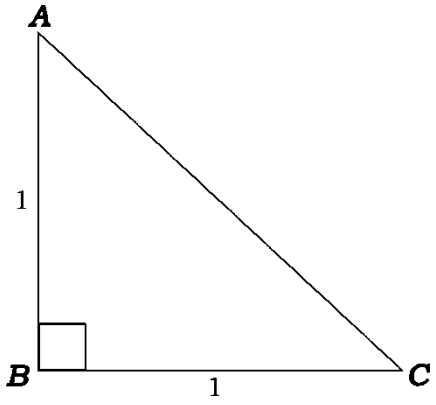


i) cosec θ

ii) tan θ.

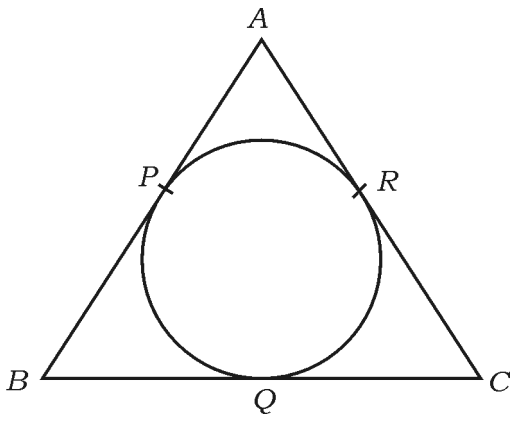
OR

In a triangle ABC, $\angle B = 90°$. Prove that $2 \sin A \cdot \cos A = 1$.



23. A box contains 20 cards which are numbered from 1 to 20. If a card is drawn randomly from the box, then find the probability of getting perfect square numbered card.

24. In the figure, if $\overline{AB} = \overline{AC}$, then prove that $\overline{BQ} = \overline{QC}$.



IV. Answer the following questions : **9 × 3 = 27**

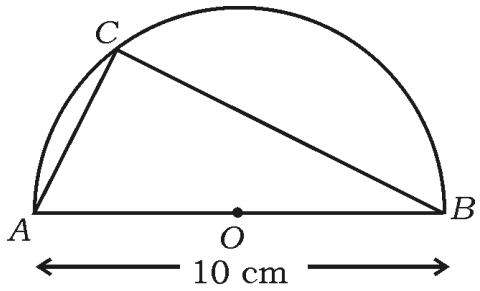
25. Find the zeroes of the polynomial $P(x) = x(x - 4)$ and verify the relationship between the zeroes and the coefficients.

26. The base of a triangle is 4 cm more than twice its height. If the area of triangle is 48 square cm, then calculate the base and height of the triangle.

OR

Some students planned a picnic. The budget for the food was Rs. 900. As 10 of them failed to join the party, the cost of the food for each member is increased by Rs. 15. Find how many students went for the picnic.

27. In the given figure *ACB* is a semicircle. If *AB* = 10 cm and *AC* = 6 cm, then find the area of the segments in the semicircle.



28. A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0·5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

OR

A hemispherical section is cut out from one face of a cubical wooden block such that the diameter 7 cm of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

29. Prove that $\sqrt{5}$ is an irrational number.

30. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$.

Show that $AB \cdot AC = AD \cdot BC$.

31. Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact".

32. Prove that $\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta$.

OR

Prove that $(\sqrt{3}+1)(3-\cot 30^\circ) = \tan^3 60^\circ - 2\sin 60^\circ$.

33. Calculate the mean for the following grouped data :

Class Interval	*Frequency*
10 – 20	4
20 – 30	6
30 – 40	5
40 – 50	4
50 – 60	1

$\Sigma f_i = 20$

OR

Calculate the median for the following grouped data :

Class Interval	*Frequency*
0 – 20	6
20 – 40	9
40 – 60	10
60 – 80	6
80 – 100	7

V. Answer the following questions : **4 × 4 = 16**

34. A question paper consists of 15 questions in total. Each question carries marks equal to the number of questions. If Dhanya answers the first 4 questions correctly, misses the next two questions and answers all the subsequent questions correctly, then find the total marks got by Dhanya using formula

OR

The seventh term of an arithmetic progression is four times the second term. Also the twelfth term is 2 more than thrice of fourth term. Find the arithmetic progression.

35. Find the solution of the following pair of linear equations by the graphical method :

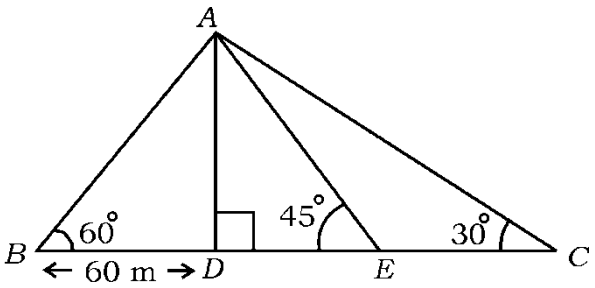
$x - y = 2$

$2x + y = 7$

36. The maximum volume of a closed cylindrical tank is 6160 m^3. The diameter of its circular base is 28 m. Find the cost of painting its surface at the rate of Rs. 5 per square metre.

37. In the given figure, find the length of *DE*, *EC*, *AC* and *AB*. Given *BD* = 60 m.

(Take $\sqrt{3} = 1{\cdot}7$)



VI. Answer the following question : **1 × 5 = 5**

38. State and prove Basic Proportionality theorem (Thales theorem).