

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

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

ರಾಜ್ಯ ಮಟ್ಟದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪೂರ್ವಸಿದ್ಧತಾ ಪರೀಕ್ಷೆ,
ಫೆಬ್ರವರಿ/ಮಾರ್ಚ್ — 2024

STATE LEVEL SSLC PREPARATORY EXAMINATION,
FEBRUARY/MARCH — 2024

ವಿಷಯ ಸಂಕೇತ : **81-E**

Subject Code : **81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

ದಿನಾಂಕ : 29. 02. 2024]

[Date : 29. 02. 2024

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 10-15 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1-30 ರವರೆಗೆ] [Time : 10-15 A.M. to 1-30 P.M.

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.

PPT-1022

[Turn over

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. $8 \times 1 = 8$

1. The maximum number of zeroes of a quadratic polynomial is

- (A) 4 (B) 1
(C) 2 (D) 3

2. The volume of a sphere of radius 'r' units is

- (A) $\frac{2}{3} \pi r^3$ cubic units
(B) $\frac{4}{3} \pi r^3$ cubic units
(C) $\frac{3}{2} \pi r^3$ cubic units
(D) $\frac{3}{4} \pi r^3$ cubic units

3. If the nature of the roots of the quadratic equation

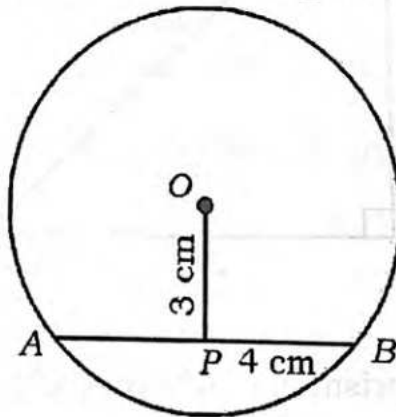
$ax^2 + bx + c = 0$ is 'real and distinct' then

- (A) $a^2 - 4bc > 0$ (B) $b^2 - 4ac = 0$
(C) $a^2 - 4bc = 0$ (D) $b^2 - 4ac > 0$

4. If $\sec A = \frac{2}{\sqrt{3}}$, then the value of $\cos A$ is

- (A) $\frac{\sqrt{2}}{3}$ (B) $\frac{3}{2}$
(C) $\frac{\sqrt{3}}{2}$ (D) $\frac{1}{\sqrt{3}}$

5. In the Arithmetic progression $x, 21, 18, \dots$ the value of 'x' is
- (A) 24 (B) 23
(C) 18 (D) -3
6. $x + 2y = c_1$ and $2x + 4y = c_2$ are pair of linear equations. If $2c_1 \neq c_2$ then the equations have
- (A) one solution (B) two solutions
(C) infinite solutions (D) no solution
7. The prime factors of 91 are
- (A) 2, 13, 7 (B) 13, 7
(C) 91, 1 (D) 13, 7, 1
8. In the given figure, $OP \perp AB$. The length of AB is

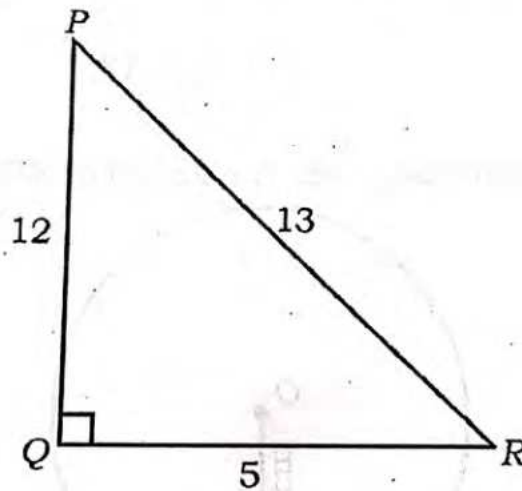


- (A) 8 cm (B) 6 cm
(C) 7 cm (D) 5 cm

II. Answer the following questions :

$8 \times 1 = 8$

9. L.C.M. of 24 and 36 is 72, then find their H.C.F.
10. Find the roots of the equation : $(x - 1)(x + 3) = 0$
11. Write the formula to find the volume of the frustum of a cone having its circular base radii r_1 and r_2 and height 'h'.
12. Find the sum of zeroes of the quadratic polynomial
 $P(x) = x^2 + 7x + 10$.
13. In the figure, $\angle PQR = 90^\circ$, then find the value of $\frac{\sin R}{\cos R}$.



14. A square based prism die whose each rectangular faces are numbered 1, 3, 4 and 6 is rolled once. Find the probability of getting number 2 on its top face.

15. $\Delta ABC \sim \Delta PQR$. If the area of ΔABC is 49 cm^2 , $AB = 7 \text{ cm}$ and $PQ = 9 \text{ cm}$ then find the area of ΔPQR .

16. If $\sin(90^\circ - A) = \cos 60^\circ$, where A is an acute angle, find the value of A .

III. Answer the following questions :

$8 \times 2 = 16$

17. Prove that $7 + \sqrt{5}$ is an irrational number.

18. Find the roots of the equation $3x^2 - 6x + 2 = 0$ using 'quadratic formula'.

19. Solve the following pair of linear equations by Elimination method :

$$4x + y = 15$$

$$x + y = 6$$

20. Find the sum of first 20 terms of the Arithmetic progression 4, 9, 14, using formula.

OR

Find the sum of the first 40 positive integers divisible by 6.

21. Find the coordinates of the point which divides the line segment joining the points $(1, 5)$ and $(-4, 0)$ in the ratio $2 : 3$.

[Turn over

81-E

6

22. If $P(A) = \frac{3}{4}$ then, show that $P(\bar{A}) \neq \frac{1}{2}$.
23. Draw a pair of tangents to the circle of radius 3.5 cm which are inclined to each other at an angle of 70° .
24. Find the value of : $\frac{\cos 45^\circ \cdot \sin 45^\circ}{\sec 30^\circ - \cot 60^\circ}$

OR

Prove that $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$.

 $9 \times 3 = 27$

IV. Answer the following questions :

25. Divide $p(x) = 3x^3 + 4x^2 - 11x + 35$ by $g(x) = x^2 - 2x + 3$ and find the quotient $[q(x)]$ and remainder $[r(x)]$.

OR

Find a quadratic polynomial, whose sum and product of its zeroes are -3 and 2 respectively and also find the zeroes of this polynomial.

26. Prove that "The lengths of tangents drawn from an external point to a circle are equal".
27. Construct a triangle ABC with sides $AC = 8$ cm, $AB = 5$ cm and $BC = 6.5$ cm. Then construct a triangle whose sides are $\frac{2}{3}$ of the corresponding sides of the triangle ABC .

28. Find the mean for the following data by direct method :

Class-interval	Frequency
2 - 6	4
6 - 10	8
10 - 14	2
14 - 18	1
18 - 22	5

OR

Find the mode for the following data :

Class-interval	Frequency
5 - 15	4
15 - 25	8
25 - 35	2
35 - 45	5
45 - 55	1

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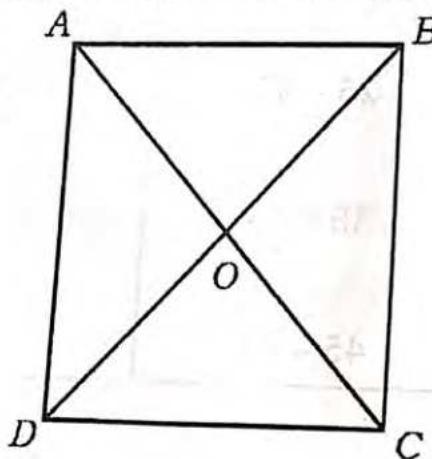
29. A production yield per hectare of wheat of 75 farms of a village is given in the following data. Draw a 'More than type' ogive.

Production yield (in kg/ha)	Number of farms (Cumulative frequency)
50 or more than 50	75
55 or more than 55	70
60 or more than 60	65
65 or more than 65	54
70 or more than 70	40
75 or more than 75	25
80 or more than 80	12

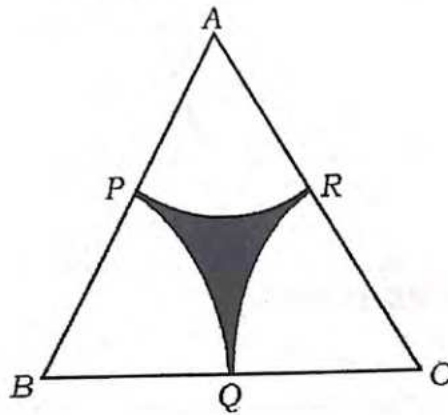
30. Find the area of a triangle whose vertices are $A(-5, -1)$, $B(3, -5)$ and $C(5, 2)$.

OR

The vertices of a square are $A(-1, -2)$, $B(1, 0)$, $C(-1, 2)$ and $D(-3, 0)$. AC and BD diagonals intersect at a point 'O' as shown in the figure. Find the length of diagonals and the coordinates of point of intersection of the diagonals.



31. In the figure, ABC is an equilateral triangle with sides 14 cm and area $49\sqrt{3}$ cm². P , Q and R are the mid-points of the sides of the triangle. If PQ , QR and RP are the arcs of a circle with centres B , C and A respectively, then find the area of the shaded region and its perimeter. [Take $\sqrt{3} = 1.7$]



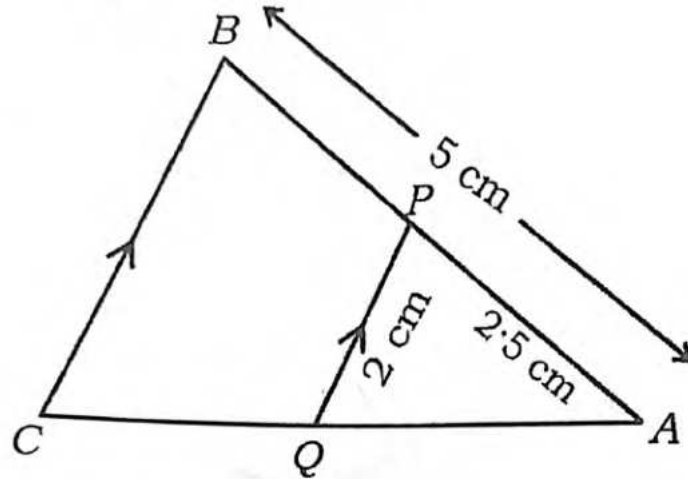
32. A motor boat whose speed is 11 km/hour in still water takes 2 hours 45 minutes to go 12 km upstream then to return downstream to the same spot. Find the speed of the stream.

OR

The sum of the reciprocals of ages of a person (in years) 3 years ago and 5 years from now is $\frac{1}{3}$. Find his present age.

33. In the given figure, $BC \parallel PQ$, $AB = 5$ cm, $PQ = 2$ cm and $AP = 2.5$ cm. Find the length of BC . Also

Prove that $\frac{\text{Area of } \Delta APQ}{\text{Area of } \Delta ABC} = \frac{1}{4}$.



V. Answer the following questions :

$4 \times 4 = 16$

34. An Arithmetic progression consists of 51 terms. The 20th term from the last term of this progression is 157. If the common difference is 5, then find the Arithmetic progression.

OR

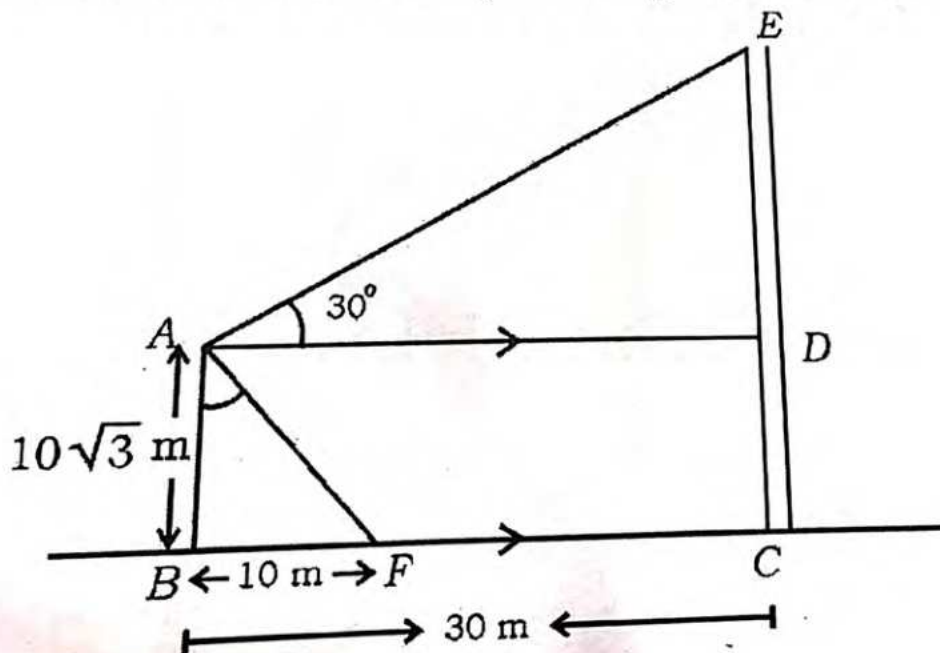
The sum of 2nd and 4th terms of an Arithmetic progression is 22 and the sum of first 11 terms is 253. Find the Arithmetic progression. If the last term of it is 67, then find the number of terms of this progression.

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

$$2x + y = 8$$

$$x + y = 5$$

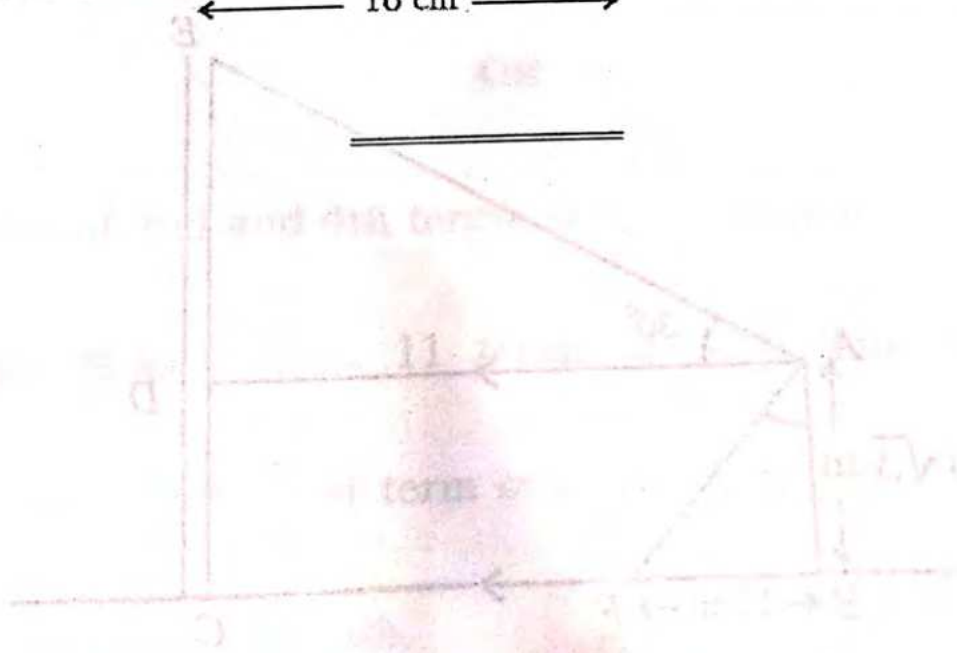
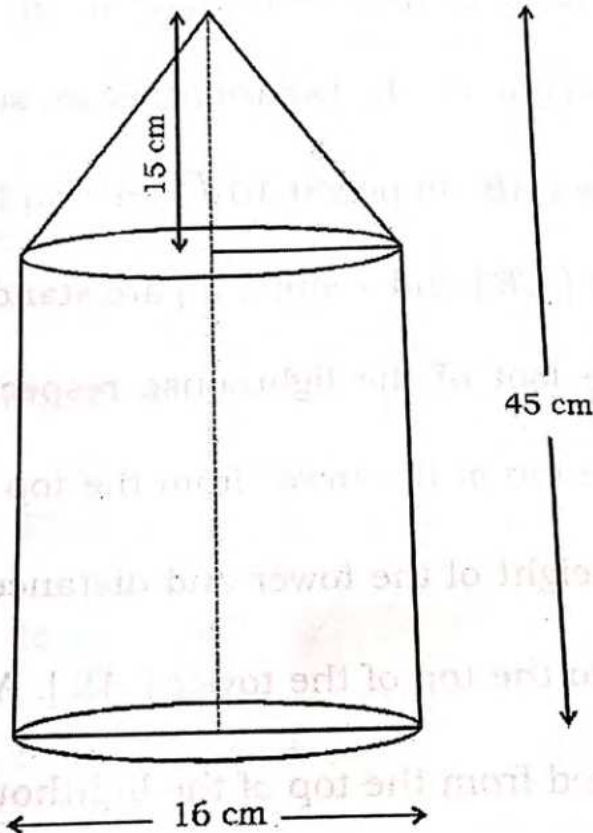
36. Prove that "If in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio [or proportion] and hence the two triangles are similar".
37. The lighthouse [AB] of height $10\sqrt{3}$ m stands vertically on a sea shore. A tower [CE] and a ship [F] are standing 30 m and 10 m away from the foot of the lighthouse respectively. The angle of elevation of the top of the tower from the top of the lighthouse is 30° . Find the height of the tower and distance between the top of the lighthouse to the top of the tower [AE]. Also find the angle of depression formed from the top of the lighthouse to the ship.



VI. Answer the following question :

$1 \times 5 = 5$

38. A wooden solid is made by mounting a right circular cone on a circular base of a cylinder as shown in the figure. If the height of the solid is 45 cm, height of the cone is 15 cm and diameter of the circular base of cylinder is 16 cm, then find the total surface area and volume of the wooden solid.



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KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD,
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ರಾಜ್ಯ ಮಟ್ಟದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪೂರ್ವಸಿದ್ಧತಾ ಪರೀಕ್ಷೆ,
ಫೆಬ್ರವರಿ / ಮಾರ್ಚ್ - 2023

STATE LEVEL SSLC PREPARATORY EXAMINATION,
FEBRUARY / MARCH-2023

ಸಂಕೇತ ಸಂಖ್ಯೆ : 81-E

ವಿಷಯ : ಗಣಿತ

Code No. : 81-E

Subject : Mathematics

ದಿನಾಂಕ : 02.03.2023]

[Date : 02.03.2023

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 10-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1-45 ರವರೆಗೆ]

[Time: 10-30 A.M. to 1.45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80]

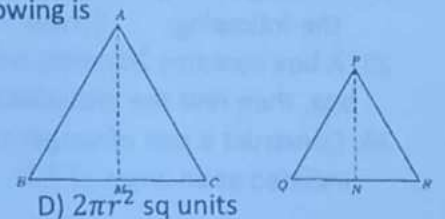
[Max. Marks : 80

General instructions to the candidate;

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2. Follow the instructions given against both the objective and subjective types of questions 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 with its letter of alphabet. $8 \times 1 = 8$

1. If 10, x, 18 are in Arithmetic progression, then the value of 'x' is
A) 12 B) 13 C) 14 D) 16
2. The Highest Common Factor of 3 and 5 is
A) 1 B) 3 C) 5 D) 15
3. The discriminant of quadratic equation $ax^2 + bx + c = 0$
A) $a^2 - 4bc$ B) $b^2 - 4ac$ C) $a^2 + 4bc$ D) $b^2 + 4ac$
4. The value of $\frac{\sin(90^\circ - \theta)}{\cos \theta}$ is
A) 0 B) 1 C) 2 D) $\frac{1}{2}$
5. The coordinates of the midpoint of the line segment joining the points P(4,7) and Q(10,3) are
A) (14,10) B) (5,7) C) (3,-5) D) (7,5)
6. The equation of line which is parallel to the line represented by the equation $4x - 8y = 11$ is
A) $4x - 16y = 22$ B) $2x + 4y = 6$ C) $8x - 16y = 21$ D) $8x + 16y = 22$
7. In the figure $\Delta ABC \sim \Delta PQR$, then the correct relation among the following is
A) $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{BC^2}{QR^2}$ B) $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{AB^2}{PN^2}$
C) $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{BC^2}{QN^2}$ D) $\frac{\text{Area of } \Delta ABC}{\text{Area of } \Delta PQR} = \frac{QR^2}{BC^2}$
8. The curved surface area of a solid hemisphere of radius 'r' units is
A) $4\pi r^2$ sq units B) $3\pi r^2$ sq units C) πr^2 sq units D) $2\pi r^2$ sq units

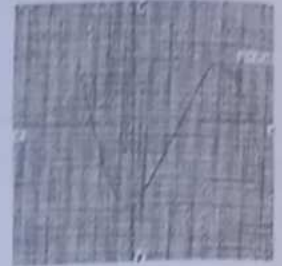


II) Answer the following questions

9. State the whether the rational number $\frac{35}{50}$ has terminating decimal expansion or non-terminating recurring decimal expansion.

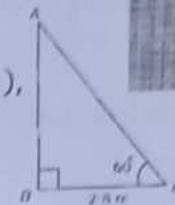
10. The graph of $y = p(x)$ is given below. Write the number of zeroes of $p(x)$.

11. A ladder is placed against a wall such that its foot is at a distance of 2.5m from the wall and its inclined at an angle of 60° with the ground. Find the length of ladder.



12. Write the formula to find the area of triangle whose vertices are (x_1, y_1) , (x_2, y_2) and (x_3, y_3)

13. For any event E, if $P(E) = 0.7$, then find $P(\bar{E})$.



14. If $\tan \theta = 1$ find the value of $\sec^2 \theta$.

15. In the figure, AB is a tangent to a circle with centre 'O'. 'P' is the point of contact. If $\angle OAP = 50^\circ$, then find $\angle AOP$.

16. Write the formula to find the total surface area of a cylinder of radius 'r' and height 'h'.

III) Answer the following questions

8 × 2 = 16

17. Prove that $3 + \sqrt{2}$ is an irrational number.

OR

The HCF and LCM of two numbers are 3 and 60 respectively. If one of the numbers is 12, then find other number.

18. Solve the given pair of linear equations: $2x - y = 4$ and $x + y = 11$

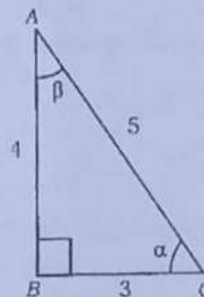
19. If the lines represented by the pair of linear equations, $2x + 3y - 8 = 0$ and $ax + by - 16 = 0$ are coincident then find the values of 'a' and 'b'

20. Find 26th term of the Arithmetic progression 3, 7, 11, Using formula

21. Find the roots of the quadratic equation $3x^2 - 5x + 2 = 0$ using quadratic formula.

OR

Find the roots of the quadratic equation $x^2 - 5x + 6 = 0$ by the method of square completion method.



22. In the given figure, ΔABC is a right angled triangle. Find the value of the following: i) $\sin \alpha$ ii) $\tan \beta$

23. A box contains 20 cards, which are numbered 1 to 20. If one card is drawn at random from the box, then find the probability of getting a perfect cube number.

24. Construct a pair of tangents to a circle of radius 3 cm, which are inclined at an angle of 60° .

IV) Answer the following questions

$$9 \times 3 = 27$$

25. A student prepares a model of atomic structure that consist of four concentric circular rings. The length of circumference of these rings are in Arithmetic progression. The sum of the circumference of first three rings is 66 cm and the circumference of the fourth ring is 44 cm. Find the circumference of the third ring using formula.



OR

The sum of first four terms of an Arithmetic Progression is 38 and the sum of first seven terms is 98. Find the first term and common difference of the Arithmetic progression.

26. Divide $p(x) = x^3 - 3x^2 + 3x - 5$ by $g(x) = x^2 - x + 1$ and find the quotient $q(x)$ and the remainder $r(x)$.

OR

Find the zeroes of the quadratic polynomial $p(x) = x^2 - 2x - 8$ and verify the relationship between the zeroes and coefficients.

27. Find the coordinates of the point 'P' on axis, which is equidistant from the points A(2,-5) and B(-2,9)

OR

Find the coordinates of the point 'P' which divides the line joining the points A(-2,-2) and B(5,12) in the ratio 3:4

28. Find the arithmetic mean for the following grouped data

Class interval	Frequency
0-2	2
2-4	6
4-6	8
6-8	3
8-10	1

OR

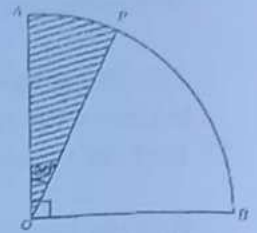
Find the mode for the following

Class interval	Frequency
0-6	2
6-12	9
12-18	15
18-24	5
24-30	1

29. During the medical check up of 60 students of a class, their weights were recorded as follows. Draw 'less than type' Ogive for the given data.

Weight (in kg)	Number of student (cumulative frequency)
Less than 45	5
Less than 50	12
Less than 55	30
Less than 60	50
Less than 65	58
Less than 70	60

30. In the figure $\triangle ABC$ is a right angled triangle and $DP \perp AB$ if $BP=6\text{cm}$, $DP=8\text{cm}$, and $AC=16\text{cm}$ then find the length of AB
31. Prove that "The length of tangents drawn from an external point to a circle are equal"
32. Construct a triangle ABC , with $AB=9\text{cm}$, $BC=5\text{cm}$ and $AC=6\text{cm}$ and then construct another triangle similar to it, whose sides are $\frac{2}{3}$ of the corresponding sides of $\triangle ABC$.
33. In the figure, $OAPB$ is a quadrant of a circle and OAP is a sector. If $\angle AOP=30^\circ$ and the area of the shaded region is 462 cm^2 , then find the length of the arc PB .



V) Answer the following questions

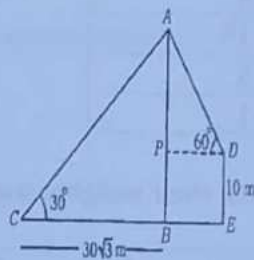
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34. Find the solution of the given pair of linear equation by graphical method. $x + y = 5$ and $3x - y = 3$
35. A motor boat whose speed is 18km/h in still water takes one hour more to go 24 km upstream than the time taken to return downstream to the same spot. Find the speed of the stream.

OR

Person 'A' is 26 years older than person 'B'. The product of their ages (in years), 3 years from now will be 360. Find the present ages of person 'A' and person 'B'

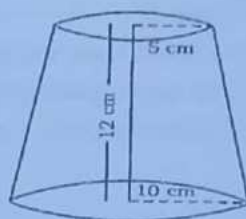
36. A tower and a building are standing vertically on a level ground. The angles of elevation of the top of the tower from a point on the same ground and from the top of the building are found to be 30° and 60° respectively. If the distance of the point from the foot of the tower is $30\sqrt{3}\text{ m}$ and height of the building is 10 m , then find the distance between the foot and the tower and building and also the distance between their tops.
37. Prove that "If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio."



VI) Answer the following questions

$1 \times 5 = 5$

38. A solid is in the shape of a frustum of a cone of height 12 cm and radii of its circular ends are 5 cm and 10 cm . Find the total surface area and volume of the solid.



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ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, 6ನೇ ಅಡ್ಡ ರಸ್ತೆ, ಮಲ್ಲೇಶ್ವರಂ,
ಬೆಂಗಳೂರು - 560 003

**KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD,
6th CROSS, MALLESHWARAM, BANGALORE - 560 003**

ರಾಜ್ಯ ಮಟ್ಟದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪೂರ್ವಸಿದ್ಧತಾ ಪರೀಕ್ಷೆ, ಫೆಬ್ರವರಿ 2022

**STATE LEVEL SSLC PREPARATORY EXAMINATION,
FEBRUARY 2022**

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : **81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

ದಿನಾಂಕ : 24. 02. 2022]

[Date : 24. 02. 2022

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 10-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 1-45 ರವರೆಗೆ] [Time : 10-30 A.M. to 1-45 P.M

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PPT-120

[Turn over

- 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. $8 \times 1 = 8$

1. A pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ have unique solution. Then the correct relation among the following is

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

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

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

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

2. The formula to find the sum of first 'n' terms of positive odd numbers is

~~(A)~~ $S_n = n(n+1)$

~~(B)~~ $S_n = n(n-1)$

(C) $S_n = n^3$

(D) $S_n = n^2$

3. The quadratic equation in the following is

~~(A)~~ $x^2 - 3x + 2 = 0$

(B) $2x + 3 = 0$

(C) $x^2 - 5x + 6$

(D) $2x^3 + 7x + 1 = 0$

4. If $A = 30^\circ$, then the value of $\sin 2A$ is

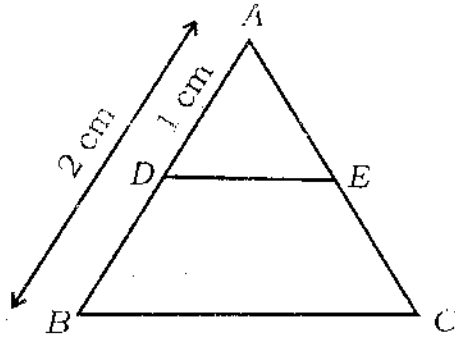
(A) $\frac{1}{\sqrt{2}}$

(B) $\frac{\sqrt{3}}{2}$

(C) 1

~~(D)~~ $\frac{1}{2}$

5. The distance of the co-ordinates $(3, 4)$ from the x -axis is
- (A) 3 units (B) 4 units
(C) 5 units (D) 7 units.
6. The x -coordinate of the point of intersection of "less than and more than" types of ogive gives the
- (A) Standard deviation (B) Mode
(C) Mean (D) Median.
7. $\Delta ADE \sim \Delta ABC$, if $AD = 1$ cm and $AB = 2$ cm then the area of ΔABC : area of ΔADE is

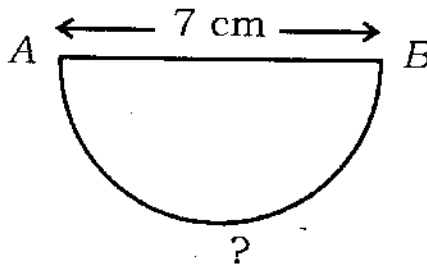


- (A) 4 : 1 (B) 1 : 4
(C) 1 : 2 (D) 2 : 1.
8. The formula to find the lateral surface area of a frustum of a cone whose circular ends having radii r_1 and r_2 and slant height l units, is
- (A) $\pi(r_1 - r_2)l$ sq.units (B) πr^2 sq.units
(C) $\pi(r_1 + r_2)l$ sq.units (D) $\pi(r_1 + r_2)h$ sq.units

II. Answer the following questions :

 $8 \times 1 = 8$

9. Write the number of solutions that the pair of linear equations $a_1x + b_1y + c_1 = 0$ and $a_1x + b_1y + c_2 = 0$ have ($c_1 \neq c_2$).
10. The 17th term of an Arithmetic progression exceeds its 10th term by 7. Write the common difference of this progression.
11. If $\sin A = \frac{3}{4}$ write the value of $\operatorname{cosec} A$.
12. Write the coordinates of the mid-point of the line segment joining the points $A(x_1, y_1)$ and $B(x_2, y_2)$.
13. State "Basic proportionality theorem".
14. If the diameter of a circle is 7 cm then write the length of its semi-circular arc.



15. Write the formula to find the surface area of a sphere whose radius is 'r' units.
16. Find the length of the side of a cube whose volume is 64 cm^3 .

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

17. Solve the following pair of linear equations by Elimination method :

$$2x + y = 14$$

$$x - y = 4$$

OR

“The difference between two positive numbers is 26 and one number is 3 times the other.” Represent this statement in the form of the pair of linear equations.

- ~~18.~~ Find the 15th term of the Arithmetic progression 3, 8, 13,
- ~~19.~~ Find the sum of first 20 terms of the Arithmetic series $2 + 7 + 12 + \dots$ using the formula.
- ~~20.~~ Find the value of the discriminant of the equation $3x^2 - 5x + 2 = 0$ and hence write the nature of the roots.

OR

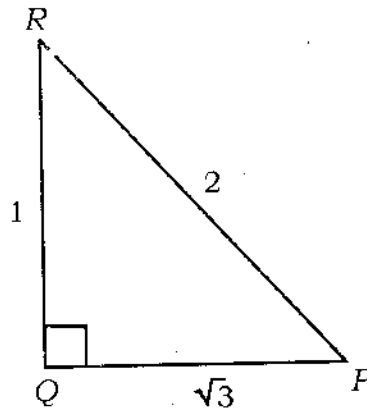
Find, for what value of 'k' the equation $kx^2 + 6x + 1 = 0$ has equal roots.

21. Find the roots of the quadratic equation $2x^2 + x - 4 = 0$ using quadratic formula.

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[Turn over

22. In the figure find the value of $\sin P$ and $\tan R$.



23. Find the distance between the points $(2, 3)$ and $(6, 6)$ using the distance formula.
24. Draw a line segment of length 8 cm and divide it in the ratio $2 : 3$ geometrically.

IV. Answer the following questions :

$9 \times 3 = 27$

25. Find the sum of all the multiples of 4 between 10 and 250.
26. If $A + B = 90^\circ$, prove that

$$\frac{\cos A}{1 + \cos B} + \frac{1 + \cos B}{\cos A} = \frac{2}{\cos A}$$

OR

Prove that
$$\frac{5 \cos^2 60^\circ + 4 \sec^2 30^\circ - \tan^2 45^\circ}{\sin^2 30^\circ + \cos^2 30^\circ} = \frac{67}{12}$$

27. Find the value of ' k ' if the points $A(7, -2)$, $B(5, 1)$ and $C(3, k)$ are collinear.

OR

- Find the coordinates of the point which divides the line segment joining the points $(4, -3)$ and $(8, 5)$ in the ratio $3 : 1$ internally.

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28. Find the mean of the following data using direct method :

<i>Class-interval</i>	<i>Frequency</i>
0 — 10	5
10 — 20	8
20 — 30	20
30 — 40	15
40 — 50	7

OR

Find the mode of the following data :

<i>Class-interval</i>	<i>Frequency</i>
1 — 4	7
4 — 7	4
7 — 10	8
10 — 13	6
13 — 16	4

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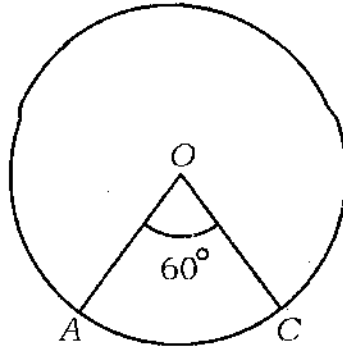
29. The following table gives production yield of wheat per hectare of 100 farms in a village. Draw a "less than type ogive" for the given data :

<i>Production yield (in kg / hectare)</i>	<i>Number of farms (cumulative frequency)</i>
Less than 50	2
Less than 55	10
Less than 60	22
Less than 65	46
Less than 70	74
Less than 75	100

30. Prove that "the lengths of tangents drawn from an external point to a circle are equal".
31. Draw a pair of tangents to a circle of radius 3 cm which are inclined to each other at angle of 70° .

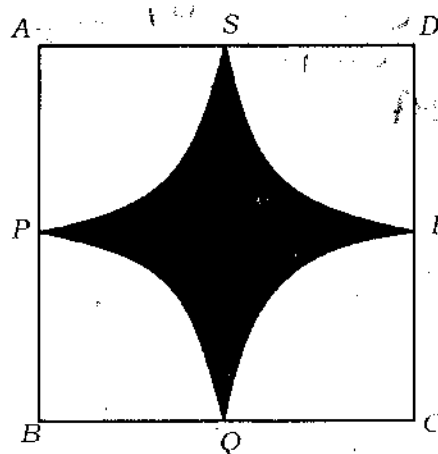
32. In a circle of radius 21 cm an arc AC subtends an angle 60° at the centre as shown in the figure then find

- the length of the arc AC
- area of the sector OAC .



OR

$ABCD$ is a square of side 14 cm. P, Q, R and S are the mid-points of AB, BC, CD and AD respectively. Also PS, PQ, QR and SR are the arcs of the circles. Find the area of the shaded region.

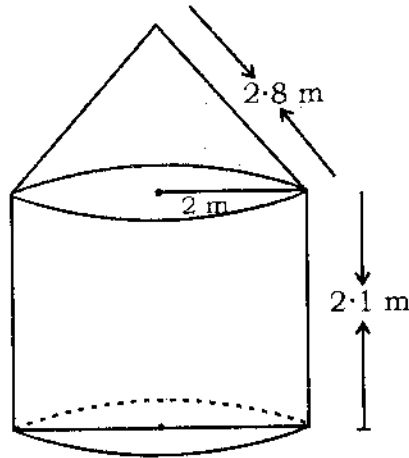


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$$\begin{aligned}
 \text{Area} &= A_{\text{sq}} - A_{\text{4 circles}} \\
 &= a^2 - 4 \times \frac{1}{4} \pi r^2 \\
 &= 14^2 - \pi \times 7^2 \\
 &= 196 - 154 \\
 &= 42 \text{ cm}^2
 \end{aligned}$$

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33. A tent is in the shape of a cylinder surrounded by a conical top as shown in the figure. The height and radius of the cylindrical part are 2.1 m and 2 m respectively. Also slant height of the cone is 2.8 m. Find the area of the canvas used for making the tent.



V. Answer the following questions :

4 × 4 = 16

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

$$x + y = 5$$

$$2x - y = 4$$

35. An express train takes 1 hour less than a passenger train to travel 132 km between two towns A and B. If the average speed of the express train is 11 km/hr more than that of a passenger train, find the average speed of these trains.

OR

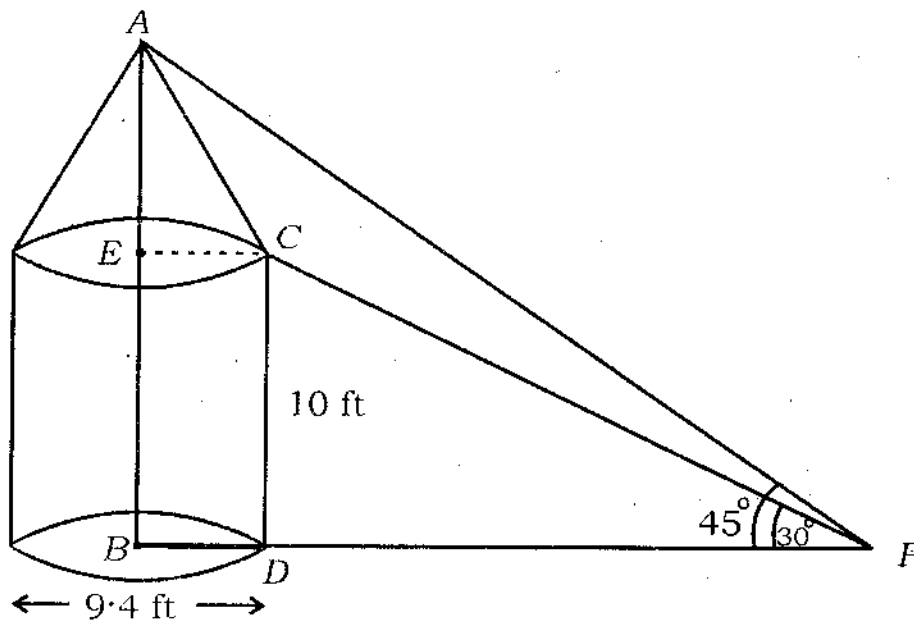
PPT-120

Find the roots of the following equation :

$$\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30} \quad (x \neq -4 \text{ and } x \neq 7)$$

36. A building on the ground is in the form of a conical tomb surmounted by a cylinder of height 10 feet as shown in the figure. From a point 'P' on the same ground the angle of elevation of the top edge of the cylinder is found to be 30° and the angle of elevation to the vertex of the cone is found to be 45° . If the diameter of the outer edge of circular base of the cylinder is 9.4 feet, then find the height of the conical shaped tomb.

(Take $\sqrt{3} = 1.73$)



PPT-120

[Turn over

ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರಿಷತ್, ಮಂಡಳಿ, 6ನೇ ಅಡ್ಡ ರಸ್ತೆ, ಮಲ್ಲೇಶ್ವರಂ,
ಬೆಂಗಳೂರು - 560 003

**KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD,
6th CROSS, MALLESWARAM, BANGALORE - 560 003**

ರಾಜ್ಯ ಮಟ್ಟದ ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪೂರ್ವಸಿದ್ಧತಾ ಪರೀಕ್ಷೆ, ಫೆಬ್ರವರಿ 2020
**STATE LEVEL SSLC PREPARATORY EXAMINATION,
FEBRUARY 2020**

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : **81-E**

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

ದಿನಾಂಕ : 18. 02. 2020]

[Date : 18. 02. 2020

ಸಮಯ : ಬೆಳಿಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 12-45 ರವರೆಗೆ]

[Time : 9-30 A.M. to 12-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80]

[Max. Marks : 80

In the following questions four alternatives are given for each question.

Choose and write the correct answer along with its alphabet.

8 × 1 = 8

1. If $180 = 2^x \times 3^2 \times 5$ then the value of x is

(A) 1

(B) 2

(C) 3

(D) 4.

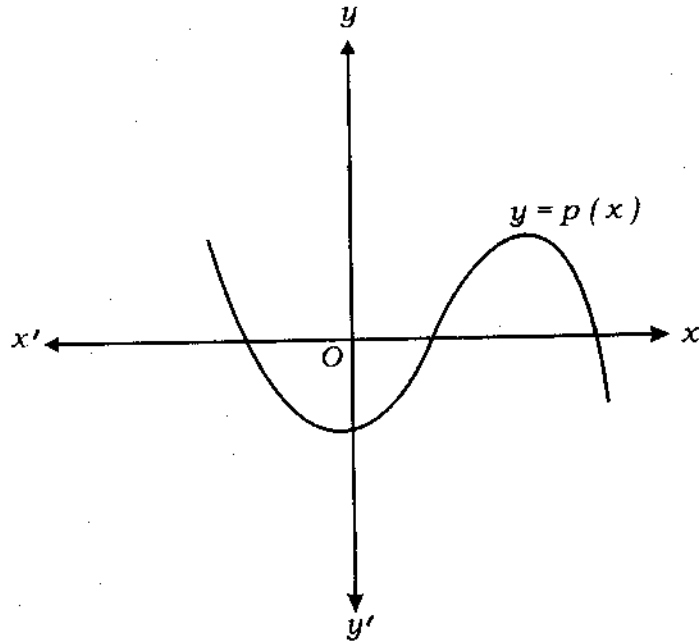
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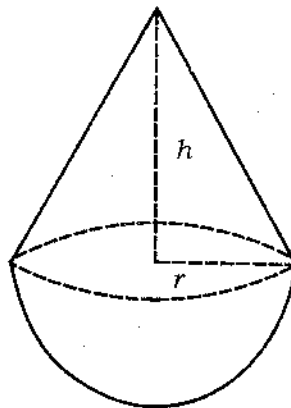
2. In the figure a polynomial $y = p(x)$ is represented through a graph, the number of zeroes of the polynomial is



- (A) 4 (B) 2
(C) 3 (D) 1.
3. The roots of the quadratic equation $x^2 + bx + c = 0$ are
- (A) $\frac{-b \pm \sqrt{b^2 - 4c}}{2}$ (B) $\frac{b \pm \sqrt{b^2 + 4c}}{2}$
(C) $\frac{-b \pm \sqrt{b^2 + 4c}}{2}$ (D) $\frac{b - \sqrt{b^2 - 4c}}{2}$
4. If $\sin \theta = \frac{3}{5}$ then the value of $\operatorname{cosec} \theta$ is
- (A) $\frac{5}{3}$ (B) $\frac{3}{5}$
(C) $\frac{4}{5}$ (D) $\frac{5}{4}$

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5. The probability of a certain event is
- (A) 0 (B) 0.5
(C) 0.75 (D) 1.
6. The corresponding sides of two similar triangles are in the ratio 1 : 4, then the ratios of their areas is
- (A) 1 : 2 (B) 1 : 16
(C) 1 : 4 (D) 16 : 1.
7. The area of the sector which is $\frac{1}{4}$ th the area of circle of radius r unit is
- (A) $\frac{\pi r^2}{360}$ sq.unit (B) $\frac{\pi r^2}{90}$ square unit
(C) $\frac{\pi r^2}{4}$ sq.unit (D) $\frac{\pi r^2}{2}$ square unit.
8. A cone is mounted on a hemisphere of radius r cm and height of the cone h cm. Then the volume of the solid is



- (A) $(\frac{4}{3}\pi r^3 + \frac{1}{3}\pi r^2 h)$ c.c. (B) $(\frac{1}{3}\pi r^3 + \pi r^2 h)$ c.c.
(C) $(\frac{3}{4}\pi r^3 + \frac{2}{3}\pi r^2 h)$ c.c. (D) $(\frac{2}{3}\pi r^3 + \frac{1}{3}\pi r^2 h)$ c.c.

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[Turn over

II. Answer the following questions :

8 × 1 = 8

9. $4x + py + 8 = 0$

$$4x + 4y + 2 = 0$$

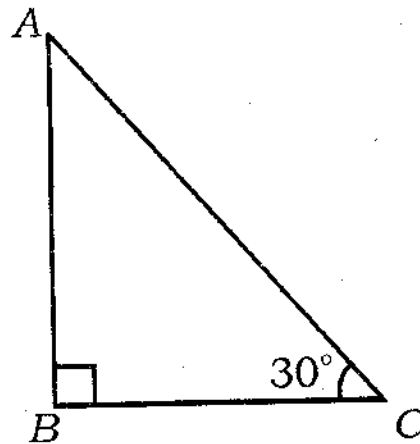
are parallel to each other then find the value of p .

10. In an A.P. $a_n = 3n + 2$ then find 12th term.

11. Find the sum of the zeroes of a polynomial $P(x) = 2x^2 - 9x + 10$.

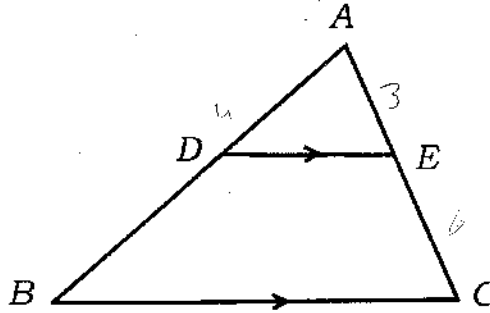
12. Find the value of $\frac{\sin 28^\circ}{\cos 62^\circ}$.

13. In a $\triangle ABC$, $AB \perp BC$, $\angle ACB = 30^\circ$, $AB = 15$ m, then find the length of BC .



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14. In figure, $DE \parallel BC$, $AE = 3$ cm, $CE = 6$ cm, $AD = 4$ cm, then find the length of AB .



15. Write the number of tangent that can be drawn to a circle at any point on it.
16. Write the formula to find the total surface area of a frustum of a cone.

III. Answer the following questions :

$8 \times 2 = 16$

17. Solve the following pair of linear equations :

$$3x + 2y = 11$$

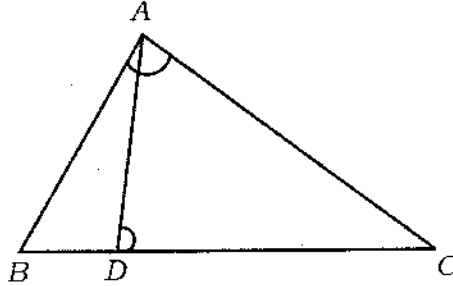
$$5x - 2y = 13.$$

18. Find the sum of first 20 terms of A.P. 3, 7, 11, 15 ... using the formula.
19. Find the discriminant of the quadratic equation $2x^2 + x + 4 = 0$, hence find the nature of its roots.
20. Find the distance between the points $A (8, 3)$ and $B (2, 11)$ by using distance formula.
21. A box contains 28 bulbs of which 7 bulbs are defective, a bulb is drawn randomly from the box. Find the probability of picking a non-defective bulb.

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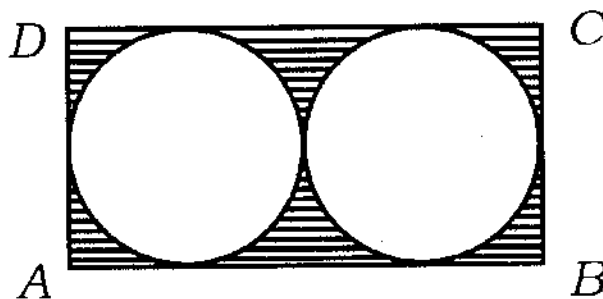
22. D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$.
Show that $CA^2 = CB \cdot CD$.



OR

In a trapezium $ABCD$, $AB \parallel CD$, AC and BD diagonals are intersect at O .
Prove that $AO \cdot OD = BO \cdot OC$.

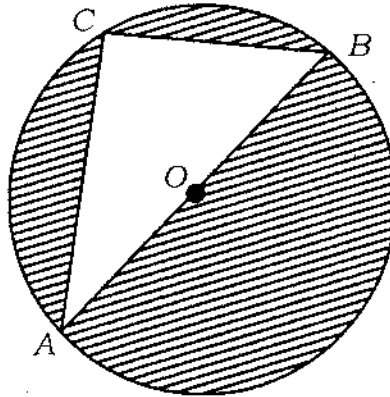
23. Draw a pair of tangents of a circle of radius 4 cm such that the angle between the tangents is 70° .
24. In the figure two congruent circles touch each other externally and also touches the sides of the rectangle $ABCD$. If $AB = 28$ cm and $BC = 14$ cm, find the area of the shaded region.



OR

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A right angled triangle of sides containing right angle are 6 cm and 8 cm is circumscribed in a circle with centre O of radius 5 cm as shown in the figure. Find the area of the shaded region.



IV. Answer the following questions :

$9 \times 3 = 27$

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

OR

Find the HCF of 135 and 75 by the prime factorisation, hence find the LCM and HCF of (135, 75) and 20.

26. If two zeroes of the polynomial $P(x) = x^3 + 2x^2 - 9x - 18$ are 3 and -3 , find other zero of the polynomial, $P(x)$.

OR

On dividing $P(x) = 3x^3 + x^2 + 2x + 5$ by a polynomial $g(x)$, the quotient and remainder obtained are $(3x - 5)$ and $(9x + 10)$ respectively. Find $g(x)$.

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27. Prove that $\frac{\cos \theta}{1 - \tan \theta} + \frac{\sin \theta}{1 - \cot \theta} = \sin \theta + \cos \theta$.

OR

Prove that $\frac{1 + \cos \theta}{\sin \theta} - \frac{\sin \theta}{1 + \cos \theta} = 2 \cot \theta$.

28. A man observes two vertical poles which are fixed opposite to each other on either side of the road. If the width of the road is 90 feet and heights of the pole are in the ratio 1 : 2, also the angle of elevation of their tops from a point between the line joining the foot of the poles on the road is 60° . Find the heights of the poles.

29. If $A(0, 5)$, $B(6, 11)$ and $C(10, 7)$ are the vertices of a ΔABC , D and E are the mid-points of AB and AC respectively. Then find the area of ΔADE .

OR

- $A(5, 8)$, $B(0, -1)$ and $C(4, 5)$ are the vertices of a ΔABC . AD is the median and G is a point on AD such that $AG : GD = 2 : 1$. Find the co-ordinate of the point G .

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30. Find the median of the following data :

<i>C-I:</i>	50 - 60	60 - 70	70 - 80	80 - 90	90 - 100
<i>f:</i>	12	14	8	6	10

31. The following distribution gives the daily income of 50 workers of a factory.

Draw its more than type ogive.

<i>Daily income in rupees</i>	100-120	120-140	140-160	160-180	180-200
<i>Number of workers</i>	5	10	20	5	10

32. Prove that the tangents drawn to a circle from an external point are equal.
33. Draw a triangle with sides 4 cm, 6 cm, 8 cm and then construct an another triangle whose sides are $\frac{3}{4}$ times the corresponding sides of the first triangle.

V. **Answer the following questions :**

$$4 \times 4 = 16$$

34. The first term of two A.P.s are equal and the ratios of their common differences is 1 : 2. If the 7th term of first A.P. and 21th term of second A.P. are 23 and 125 respectively. Find two A.P.s.

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35. Sanvi purchased some books for Rs. 120. If she purchased 3 more books for the same amount each book would have cost her Rs. 2 less. Find the number of books purchased by Sanvi and the price of each book.

OR

A motor boat goes down the stream 30 km and again returns to the starting point in a total time of 4 hours and 30 minutes. If the speed of the stream is 5 km/hr, then find the speed of the motor boat in still water.

36. Prove that "In a right angled triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides".

37. Solve the following pair of linear equations graphically :

$$2x + y = 5$$

$$x + y = 4.$$

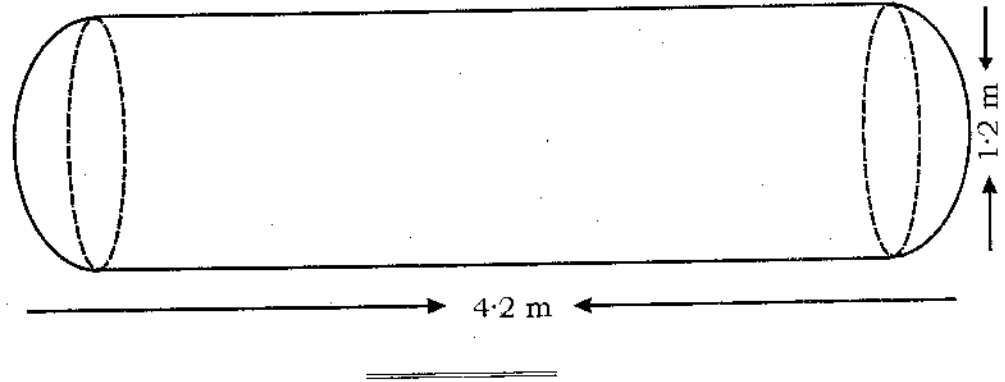
VI. Answer the following question :

 $1 \times 5 = 5$

38. A Social Welfare Association decides to supply drinking water for the flood affected people. The drinking water is filled in a water tanker which is in the shape of a cylinder with hemispherical end as shown in the figure. The whole length of the tanker is 4.2 metre and the diameter of base of the

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cylinder and two hemispheres are each 1.2 m. If they distribute drinking water to 60 people in a container, each is in the shape of a cylinder of radius 21 cm and height 50 cm, find the quantity of water left in the tanker after distribution in litre. ($\pi = \frac{22}{7}$)



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X STANDARD STATE LEVEL PREPARATORY EXAMINATION-FEBRUARY - 2019

Time : 2.45 min.

SUBJECT : MATHEMATICS

EM

Marks : 80

1. 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. 1x8=8

1. Area of a sector of angle p (in degrees) of a circle with radius r is,
 A) $\frac{p}{720} \times 2\pi r^2$ B) $\frac{p}{360} \times 2\pi r$ C) $\frac{p}{180} \times \pi r^2$ D) $\frac{p}{180} \times 2\pi r$

2. The distance of a point $p(x, y)$ from the origin $O(0, 0)$ is given by
 A) $\sqrt{x^2 - y^2}$ B) $\sqrt{x^2 + y^2}$ C) $\sqrt{x^2 \times y^2}$ D) $\sqrt{x^2 + y^2}$

3. H.C.F. of 95 and 152 is
 A) 57 B) 38 C) 19 D) 8

4. The Quadratic Polynomial having zeroes -2 and 4 is
 A) $x^2 + 2x + 8$ B) $x^2 - 2x - 8$ C) $x^2 + 2x - 8$ D) $x^2 - 2x + 8$

5. If $x^2 - 2x + 1 = 0$ then $x + \frac{1}{x}$ is equal to
 A) 1 B) 3 C) 2 D) 4

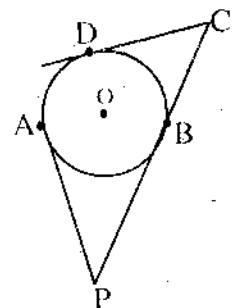
6. The value of $\sin^2 60^\circ - \sin^2 30^\circ$ is
 A) $-\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) $\frac{1}{2}$

7. $P(E) + P(\bar{E})$ is equal to
 A) 1 B) 2 C) 0 D) 3

8. LSA of a cylinder whose circumference is 44 cm and height 10cm is,
 A) 120cm^2 B) 440cm^2 C) 110cm^2 D) 220cm^2

II.

9. In the figure, find the length of the tangent CD if $AP=3\text{cm}$ and $PC=8\text{cm}$.



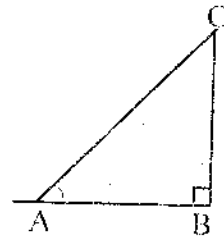
1x6=6

10. Write the decimal expansion of the Rational Number $\frac{35}{50}$ without actual division.

11. Find the Quadratic Polynomial the sum and product of whose Zeroes are -3 and 2 respectively.

12. In the given fig.

$$\sin A = \frac{3}{4}, \text{ find } \cos A.$$



13. Find the mean of the following data.

7, 6, 5, 0, 7, 8, 9

14. Write the formula used to find the surface area of the sphere.

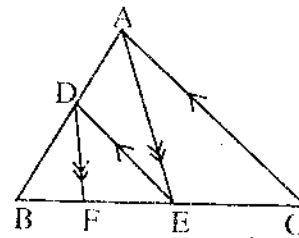
III.

2x16=32

15. Find arithmetic Progression whose third term is 16 and the seventh term exceeds the 5th term by 12.

16. In the given figure $DE \parallel AC$ and $DF \parallel AE$.

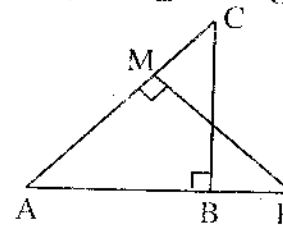
$$\text{Prove that } \frac{BF}{FE} = \frac{BE}{EC}$$



OR

In the given figure. $\triangle ABC$ and $\triangle AMP$ are two right triangles, right angled at B and M respectively.

Prove that i) $\triangle ABC \parallel \triangle AMP$ ii) $\frac{CA}{PA} = \frac{BC}{MP}$



17. Solve : $2x+3y = 11$

$$2x-4y=-24.$$

18. The difference between two numbers is 26 and one number is three times the other. Find the numbers.

19. Check whether $(5, -2)$, $(6, 4)$ and $(7, -2)$ are the vertices of an Isosceles triangle.

OR

Find the area of the triangle ABC whose vertices are A $(2, 3)$, B $(-1, 0)$ and C $(2, -4)$.

20. Show that $5-\sqrt{3}$ is Irrational number.

21. Divide the Polynomial $P(x)=x^4-3x^2+4x+5$ by the Polynomial $g(x)=x^2-x+1$ and find the quotient and the remainder.

22. Find the Zeroes of the Quadratic polynomial $x^2+7x+10$ and verify the relationship between the zeroes and the coefficients.

23. Solve by using the formula. $2x^2-7x+3=0$

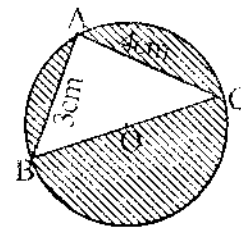
KSSSHMS & CPUCPA-2, Mathematics - 2019

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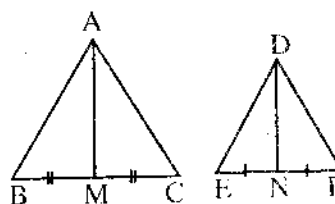
24. The following data gives the information on the observed life times (in hours) of 225 electrical components. Find the modal life time of the components. (Find the Mode)

Life time (in hours)	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

25. A drinking glass vessel is in the shape of frustum of a cone of height 14cm. The diameters of its two circular ends are 4cm and 2cm. Find the capacity of the glass vessel.
26. A die is thrown twice. What is the probability that
- 5 will not come up either time ?
 - 5 will come up at least once ?
27. Construct a pair of tangents to a circle of radius 4cm. Which are inclined to each other at an angle of 60° . Measure the length of tangent and write.
28. In the given figure, BC is diameter. If $AB = 3\text{cm}$, $AC = 4\text{cm}$ and $\angle A = 90^\circ$. Find the area of the shaded region. ($\pi = 3.14$)



29. Find the coordinates of the points of trisection (Points dividing in three equal parts) of the line segments joining the points $A(1, -2)$ and $B(-3, -4)$.
30. In the given figure $\triangle ABC \parallel \triangle DEF$ Area of $\triangle ABC = 121\text{cm}^2$ and area of $\triangle DEF = 64\text{cm}^2$. If the median of the $\triangle ABC$ is 12.1cm. Then find the median of the $\triangle DEF$.



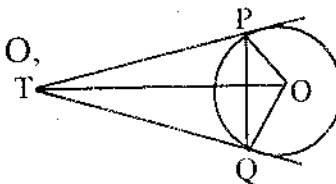
IV.

$3 \times 6 = 18$

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

OR

Two tangents TP and TQ are drawn to a circle with centre O, from an external point T. Prove that $\angle PTQ = 2\angle OPQ$



32. A toy is in the form a cone of radius 3.5cm mounted on a hemisphere of same radius. The total height of the toy is 15.5cm. Find the total surface area of the Toy.

OR

A 20 meter deep well with diameter 7 meter is dug and the earth from digging is evenly spread out to form a platform 22m x 14m. Find the height of the platform.

33. During the medical check up of 35 students of a class, their weights were recorded as follows.

Weight	< 38	< 40	< 42	< 44	< 46	< 48	< 50	< 52
No. of students	0	3	5	9	14	28	32	35

- Draw a 'Less than type' ogive for the given data. Hence obtain the median weight from the graph.
34. Draw a triangle ABC with side BC=6cm, AB=5cm and $\angle ABC=60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.
35. If the roots of the Quadratic equation $(a-b)x^2 + (b-c)x + (c-a) = 0$ are equal, then prove that $2a=b+c$.

OR

Solve for x $\frac{1}{(a+b+x)} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$ $\{a \neq 0, b \neq 0, x \neq 0, x \neq -(a+b)\}$

36. Prove that $\frac{\sin \theta}{1-\cos \theta} + \frac{\tan \theta}{1+\cos \theta} = \cot \theta + \sec \theta \cdot \operatorname{cosec} \theta$

OR

Prove that $\frac{\cos 70^\circ}{\sin 20^\circ} + \frac{\cos 55^\circ \cdot \operatorname{cosec} 35^\circ}{\tan 5^\circ \cdot \tan 25^\circ \cdot \tan 65^\circ \cdot \tan 85^\circ} = 2$

V.

4x4=16

37. In the right angled triangle, the square of the hypotenuse is equal to the sum of the square of the other two sides. PROVE.
38. Solve the equations graphically. $2x+3y = 12$
 $x-y=1$
39. Height 1.5 meter boy is standing at some distance from a 30 meter tall building. The angle of elevation from his eyes to the top of the building increases from 30° to 60° as he walks towards the building. Find the distance he walked towards the building.
40. The sum of first 8 term of an AP is 100 and sum of first 19 terms is 551. Find AP.

OR

The third term of an A.P. is 8 and the Ninth term of an A.P. exceeds three times the third term by 2. Find the sum of its first 19 terms.
