CAREERS360

KARNATAKA SSLC MATHEMATICS QUESTION PAPER 2019 (SET A TO D)

A

SL. No. : P

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 40]
Total No. of Questions : 40]

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12
[Total No. of Printed Pages : 12

CCE RF
REVISED

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Fresh)

ದಿನಾಂಕ : 25. 03. 2019]

[Date : 25. 03. 2019

ಸಮಯ : ಬೆಳಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 12-30 ರವರೆಗೆ] [Time : 9-30 A.M. to 12-30 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80]

[Max. Marks : 80

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ

General Instructions to the Candidate :

1. This Question Paper consists of 40 objective and subjective types of questions.
2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.
3. Follow the instructions given against both the objective and subjective types of questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. 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.

Tear here

I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. If the *n*-th term of an arithmetic progression $a_n = 24 - 3n$, then its 2nd term is

   (A) 18 (B) 15

   (C) 0 (D) 2

2. The lines represented by $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ are

   (A) Intersecting lines

   (B) Perpendicular lines to each other

   (C) Parallel lines

   (D) Coincident lines

3. A straight line which passes through two points on a circle is

   (A) a chord (B) a secant

   (C) a tangent (D) the radius

4. If the area of a circle is 49π sq.units then its perimeter is

   (A) 7π units (B) 9π units

   (C) 14π units (D) 49π units

5. "The product of two consecutive positive integers is 30." This can be expressed algebraically as

   (A) $x(x + 2) = 30$

   (B) $x(x - 2) = 30$

   (C) $x(x - 3) = 30$

   (D) $x(x + 1) = 30$

6. If a and b are any two positive integers then HCF (a, b) × LCM (a, b) is equal to

(A) $a + b$ (B) $a - b$

(C) $a \times b$ (D) $a \div b$

7. The value of $\cos 48° - \sin 42°$ is

(A) 0 (B) $\frac{1}{4}$

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

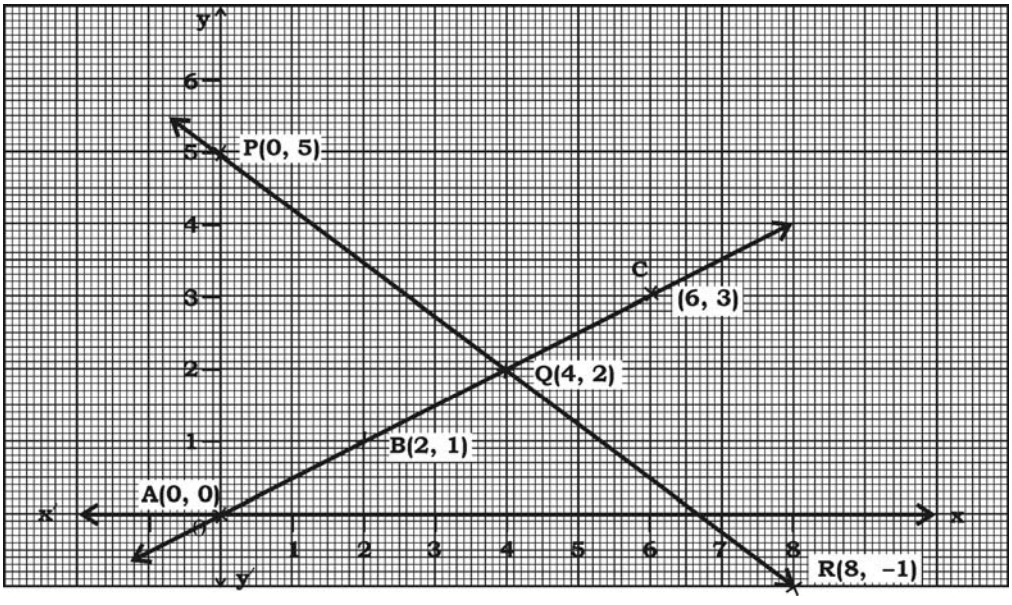
8. If $P(A) = 0{\cdot}05$ then $P(\overline{A})$ is

(A) 0·59 (B) 0·95

(C) 1 (D) 1·05

II. Answer the following : $6 \times 1 = 6$

9. The given graph represents a pair of linear equations in two variables. Write how many solutions these pair of equations have.



10. $17 = 6 \times 2 + 5$ is compared with Euclid's Division lemma $a = bq + r$, then which number is representing the remainder ?

11. Find the zeroes of the polynomial $P(x) = x^2 - 3$.

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

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

$2x^2 - 4x + 3 = 0$.

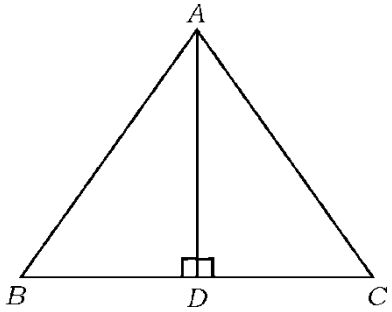
14. Write the formula to calculate the curved surface area of the frustum of a cone.

III. Answer the following :

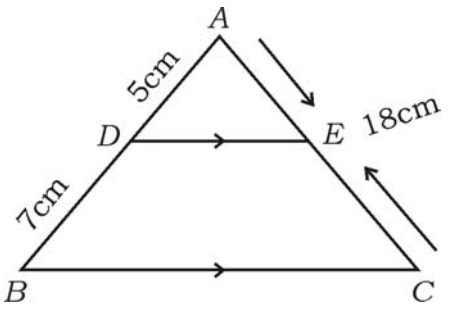
15. Find the sum of first twenty terms of Arithmetic series $2 + 7 + 12 + \ldots$ using suitable formula. 2

16. In ΔABC, $AD \perp BC$ and $AD^2 = BD \times CD$. Prove that

$AB^2 + AC^2 = (BD + CD)^2$. 2

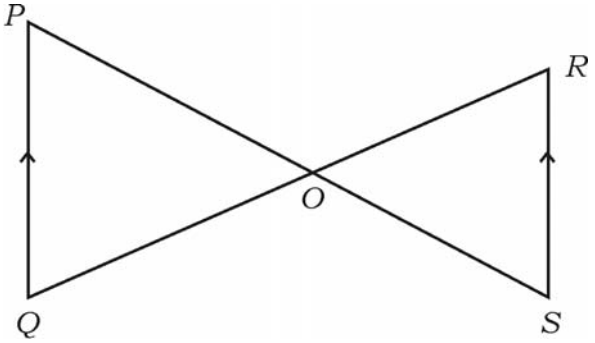


17. In ΔABC, $DE \parallel BC$. If $AD = 5$ cm, $BD = 7$ cm and $AC = 18$ cm, find the length of AE. 2



OR

In the given figure if $PQ \parallel RS$, prove that $\Delta POQ \sim \Delta SOR$.

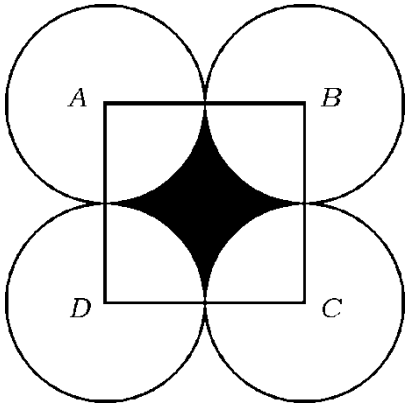


18. Solve the following pair of linear equations by any suitable method : 2

$x + y = 5$

$2x - 3y = 5.$

19. In the figure, $ABCD$ is a square of side 14 cm. A, B, C and D are the centres of four congruent circles such that each circle touches externally two of the remaining three circles. Find the area of the shaded region. 2



20. Draw a circle of radius 4 cm and construct a pair of tangents such that the angle between them is 60°. 2

21. Find the co-ordinates of point which divides the line segment joining the points A (4, $-$ 3) and B (8, 5) in the ratio 3 : 1 internally. 2

22. Prove that $3 + \sqrt{5}$ is an irrational number. 2

23. The sum and product of the zeroes of a quadratic polynomial $P(x) = ax^2 + bx + c$ are -3 and 2 respectively. Show that $b + c = 5a$. 2

24. Find the quotient and the remainder when $P(x) = 3x^3 + x^2 + 2x + 5$ is divided by $g(x) = x^2 + 2x + 1$. 2

25. Solve $2x^2 - 5x + 3 = 0$ by using formula. 2

26. The length of a rectangular field is 3 times its breadth. If the area of the field is 147 sq.m, find its length and breadth. 2

27. If $\sin\theta = \frac{12}{13}$, find the values of $\cos\theta$ and $\tan\theta$. 2

OR

If $\sqrt{3}\tan\theta = 1$ and θ is acute, find the value of $\sin 3\theta + \cos 2\theta$.

28. Prove that $\left(\frac{1+\cos\theta}{1-\cos\theta}\right) = (\operatorname{cosec}\theta + \cot\theta)^2$. 2

29. A cubical die numbered from 1 to 6 is rolled twice. Find the probability of getting the sum of numbers on its faces is 10. 2

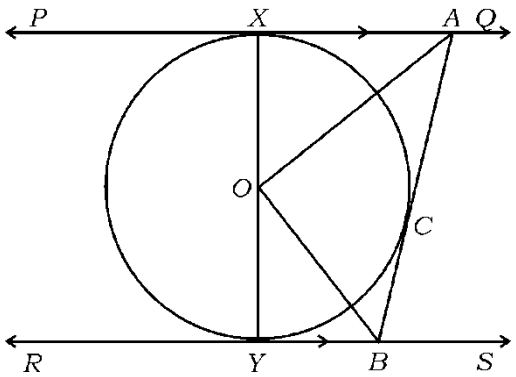
30. The radii of two circular ends of a frustum of a cone shaped dustbin are 15 cm and 8 cm. If its depth is 63 cm, find the volume of the dustbin. 2

IV. Answer the following :

31. Prove that "the lengths of tangents drawn from an external point to a circle are equal". 3

OR

In the given figure *PQ* and *RS* are two parallel tangents to a circle with centre *O* and another tangent *AB* with point of contact *C* intersecting *PQ* at *A* and *RS* at *B*. Prove that $\angle AOB = 90°$.



32. Calculate the median of the following frequency distribution table : 3

Class-interval	*Frequency* (f_i)
1 — 4	6
4 — 7	30
7 — 10	40
10 — 13	16
13 — 16	4
16 — 19	4

$\Sigma f_i = 100$

OR

Calculate the mode for the following frequency distribution table.

Class-interval	*Frequency* (f_i)
10 — 25	2
25 — 40	3
40 — 55	7
55 — 70	6
70 — 85	6
85 — 100	6

$\Sigma f_i = 30$

33. During the medical check-up of 35 students of a class, their weights were recorded as follows. Draw a less than type of ogive for the given data : 3

Weight (in kg)	*Number of students*
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

34. The seventh term of an Arithmetic progression is four times its second term and twelfth term is 2 more than three times of its fourth term. Find the progression. 3

OR

A line segment is divided into four parts forming an Arithmetic progression. The sum of the lengths of 3rd and 4th parts is three times the sum of the lengths of first two parts. If the length of fourth part is 14 cm, find the total length of the line segment.

35. The vertices of a Δ *ABC* are *A* (– 3, 2), *B* (– 1, – 4) and *C* (5, 2). If *M* and *N* are the mid-points of *AB* and *AC* respectively, show that 2 *MN* = *BC*.

3

OR

The vertices of a Δ *ABC* are *A* (– 5, – 1), *B* (3, – 5), *C* (5, 2). Show that the area of the Δ *ABC* is four times the area of the triangle formed by joining the mid-points of the sides of the triangle *ABC*.

36. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then construct another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle. 3

V. Answer the following :

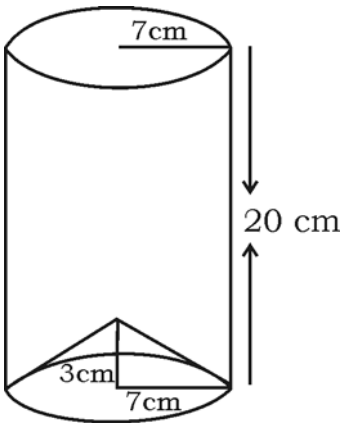
37. Find the solution of the following pairs of linear equation by the graphical method : 4

$2x + y = 6$

$2x - y = 2$

38. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Find the height of the tower. 4

39. The bottom of a right cylindrical shaped vessel made from metallic sheet is closed by a cone shaped vessel as shown in the figure. The radius of the circular base of the cylinder and radius of the circular base of the cone are each is equal to 7 cm. If the height of the cylinder is 20 cm and height of cone is 3 cm, calculate the cost of milk to fill completely this vessel at the rate of Rs. 20 per litre. 4



OR

A hemispherical vessel of radius 14 cm is fully filled with sand. This sand is poured on a level ground. The heap of sand forms a cone shape of height 7 cm. Calculate the area of ground occupied by the circular base of the heap of the sand.

40. Prove that "the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides". 4

B

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ಇಲ್ಲಿಂದ ಕತ್ತರಿಸಿ

CCE RR
UNREVISED

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Code No. : 81-E

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(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Repeater)

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[Max. Marks : 80

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I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. If $A = \{4, 8, 12, 16, 20, 24\}$ and $B = \{4, 20, 28\}$ then $A \cap B$ is

   (A) $\{4, 8, 12, 16, 20, 24, 28\}$

   (B) $\{4, 20\}$

   (C) $\{28\}$

   (D) $\{\ \}$

2. The sum to infinite terms of a Geometric progression whose first term is a and common ratio r is given by the formula.

   (A) $S_\infty = \frac{a}{1-r}$

   (B) $S_\infty = \frac{1-r}{a}$

   (C) $S_\infty = \frac{a}{1+r}$

   (D) $S_\infty = a(1-r)$

3. If H and L are the HCF and LCM of two numbers A and B respectively then

   (A) $A \times H = L \times B$

   (B) $A \times B = L \times H$

   (C) $A + B = L + H$

   (D) $A + B = L - H$

4. The degree of the polynomial $P(x) = 2x^3 + 3x^2 - 11x + 6$ is

(A) 2 (B) 6

(C) 3 (D) 4

5. The standard form of a quadratic equation is

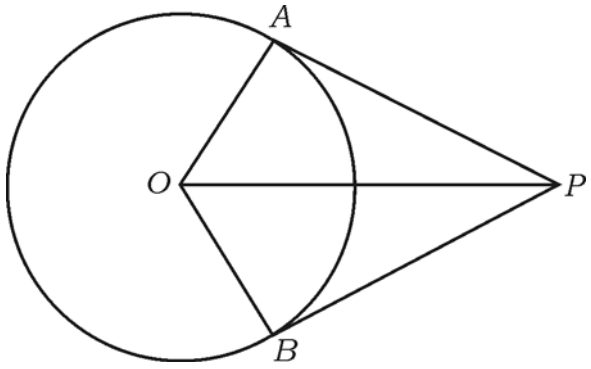
(A) $ax^2 = 0$

(B) $ax^2 + bx = 0$

(C) $ax^2 + c = 0$

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

6. In the given figure, $\overline{PA}$ and $\overline{PB}$ are the tangents to the circle with centre O. If $\angle AOB = 100°$, then $\angle APO$ is



(A) 50°

(B) 80°

(C) 90°

(D) 40°

7. The value of $\tan^2 60° + 2 \tan^2 45°$ is

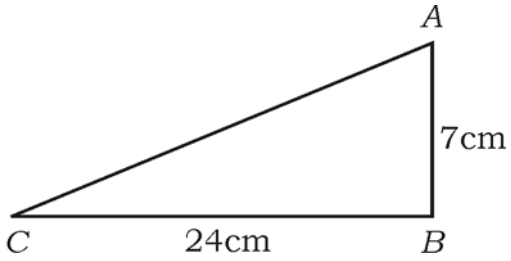
(A) 5

(B) $\sqrt{3}+1$

(C) 4

(D) $\sqrt{3}+2$

8. In $\triangle ABC$ right angled at B, $\overline{AB}$ = 7 cm, $\overline{BC}$ = 24 cm. Then length of $\overline{AC}$ is



(A) 30 cm

(B) 17 cm

(C) 25 cm

(D) 19 cm

II. Answer the following questions : $6 \times 1 = 6$

9. Find the arithmetic mean of 16 and 20.

10. Find the value of ${}^5P_3$.

11. The probability of winning a game is 0·8. What is the probability of losing the same game ?

12. The Mean ($\bar{x}$) of certain scores is 60 and the standard deviation (σ) of the same scores is 3. Find the coefficient of variation of the scores.

13. Find the remainder obtained when $P(x) = 4x^2 - 7x + 9$ is divided by $(x - 2)$.

14. Write the discriminant of the quadratic equation $ax^2 + c = 0$.

III. Answer the following questions :

15. In a group of 60 people, 40 people like to read newspapers, 35 people like to read magazines and 26 people like to read both. Find the number of people who read neither newspapers nor magazines. 2

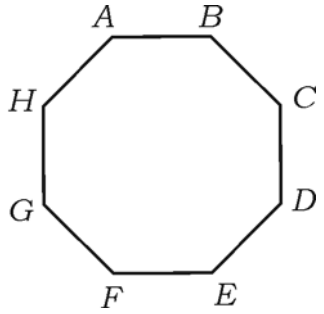
16. Find the tenth term of the progression $\frac{1}{5}, \frac{1}{3}, 1, -1, \ldots$. 2

17. Prove that $3 + \sqrt{5}$ is an irrational number. 2

18. a) State the fundamental principle of counting.

b) Write the value of 0 ! 2

19. Using a suitable formula calculate the number of diagonals that can be drawn in the given polygon. 2



20. In an experiment of tossing a fair coin twice, find the probability of getting

a) two heads

b) exactly one tail. 2

21. Find the product of $\sqrt[3]{2}$ and $\sqrt{3}$. 2

22. Rationalise the denominator and simplify : 2

$$\frac{\sqrt{3}}{\sqrt{3}+\sqrt{2}}$$

23. Find the quotient and the remainder using synthetic division :

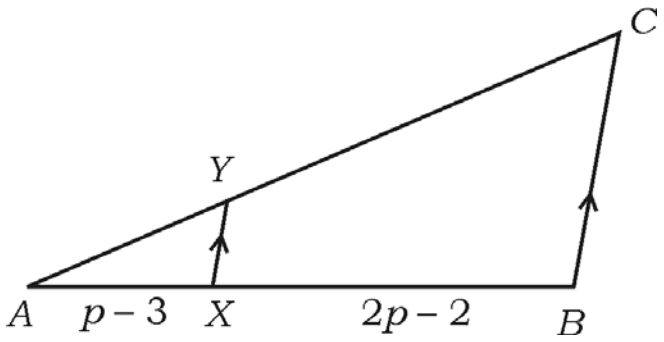
$(x^3 + x^2 - 3x + 5) \div (x - 1)$. 2

OR

If one of the zeros of the polynomial $x^2 - x - (2k + 2)$ is -4, find the value of k.

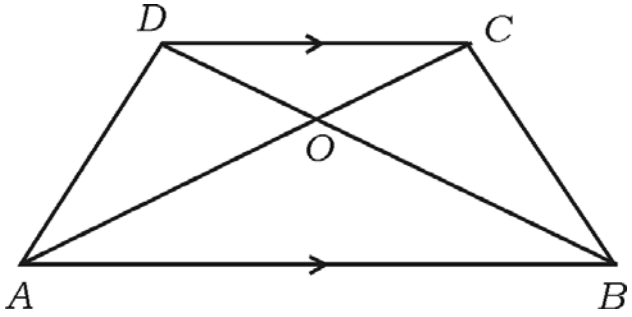
24. Draw a circle of radius 4 cm and construct a tangent at one end of its diameter. 2

25. In the following figure, $\overline{AX} = p - 3$, $\overline{BX} = 2p - 2$, $\frac{AY}{YC} = \frac{1}{4}$. Find p. 2



OR

In the trapezium $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\overline{AB} = 2\overline{CD}$ and area of ΔAOB is 84 cm^2. Find the area of ΔCOD.



26. Given $\tan A = \frac{3}{4}$, find $\sin A$ and $\cos A$. 2

27. Find the equation of a line having angle of inclination 45° and y-intercept is 2. 2

28. Find the distance between the points $A(6, 5)$ and $B(4, 4)$. 2

29. The curved surface area of a right circular cone is 4070 cm^2 and its slant height is 37 cm. Find the radius of the base of the cone. 2

30. Draw a plan of a level ground using the information given below : 2

(Scale 20 m = 1 cm)

	Metre To C	
To D 100	220 160	
To E 60	120 80	80 to B
	From A	

IV. Answer the following questions :

31. Prove that the tangents drawn from an external point to a circle

a) are equal

b) subtend equal angles at the centre

c) are equally inclined to the line joining the centre and the external point. 3

32. The circumference of the circular base of a right cylindrical vessel is 132 cm and its height is 25 cm. Calculate the maximum quantity of water it can hold. (Use $\pi = \frac{22}{7}$). 3

OR

A solid metallic right circular cone is of height 20 cm and its base radius is 5 cm. This cone is melted and recast into a solid sphere. Find the radius of the sphere. (Use $\pi = \frac{22}{7}$).

33. Find the standard deviation for the following data : 3

Marks (x)	*Number of students (f)*
35	2
40	4
45	8
50	4
55	2

34. A building and a tower are on the same level ground. The angle of elevation of the top of the building from the foot of the tower is 30°. The angle of elevation of the top of the tower from the foot of the building is 60°. If the height of the tower is 50 m, then find the height of the building. 3

OR

Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

35. Solve by using formula : 3

$x^2 - 2x + 3 = 3x + 1.$

OR

If m and n are the roots of the quadratic equation $x^2 - 6x + 2 = 0$, then find the value of

a) $\frac{1}{m} + \frac{1}{n}$

b) $(m + n)(mn)$.

36. Prove that the area of an equilateral triangle of side 'a' units is $\frac{a^2\sqrt{3}}{4}$ square units. 3

OR

ΔABC is right angled triangle right angled at C. D is a point on the side $\overline{AC}$ and E is a point on the side $\overline{BC}$. Show that

$AB^2 + DE^2 = AE^2 + BD^2$.

V. Answer the following questions :

37. Construct direct common tangents to two circles of radii 4 cm and 2 cm whose centres are 8 cm apart. 4

38. Find the sum of first ten terms of an Arithmetic progression whose fourth term is 13 and eighth term is 29. 4

OR

Find the three consecutive terms of a Geometric progression whose sum is 14 and their product is 64.

39. Prove that "if two triangles are equiangular, then their corresponding sides are in proportion". 4

40. Solve graphically : $x^2 - x - 2 = 0$. 4

C

SL. No. : P

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50]
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[Max. Marks : 100

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5. 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.

Tear here

I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. If the n-th term of an arithmetic progression $a_n = 24 - 3n$, then its 2nd term is

   (A) 18 (B) 15

   (C) 0 (D) 2

2. The lines represented by $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ are

   (A) Intersecting lines (B) Perpendicular lines to each other

   (C) Parallel lines (D) Coincident lines

3. A straight line which passes through two points on a circle is

   (A) a chord (B) a secant

   (C) a tangent (D) the radius

4. If the area of a circle is 49π sq.units then its perimeter is

   (A) 7π units (B) 9π units

   (C) 14π units (D) 49π units

5. "The product of two consecutive positive integers is 30." This can be expressed algebraically as

   (A) $x(x + 2) = 30$ (B) $x(x - 2) = 30$

   (C) $x(x - 3) = 30$ (D) $x(x + 1) = 30$

6. If a and b are any two positive integers then HCF $(a, b) \times$ LCM (a, b) is equal to

   (A) $a + b$ (B) $a - b$

   (C) $a \times b$ (D) $a \div b$

7. The value of $\cos 48° - \sin 42°$ is

(A) 0 (B) $\frac{1}{4}$

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

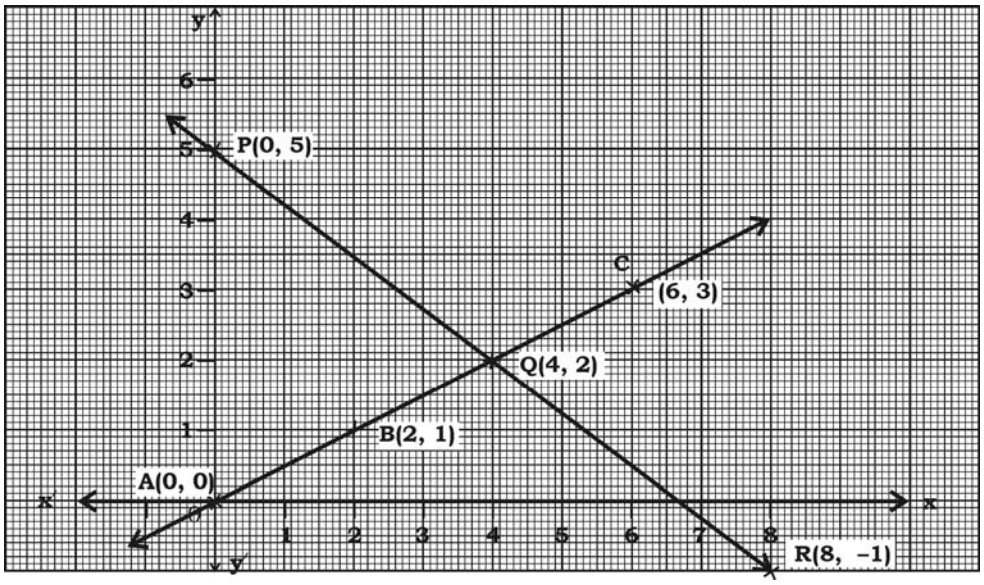
8. If $P(A) = 0{\cdot}05$ then $P(\overline{A})$ is

(A) 0·59 (B) 0·95

(C) 1 (D) 1·05

II. Answer the following : $6 \times 1 = 6$

9. The given graph represents a pair of linear equations in two variables. Write how many solution these pair of equations have.



10. $17 = 6 \times 2 + 5$ is compared with Euclid's Division lemma $a = bq + r$, then which number is representing the remainder ?

11. Find the zeroes of the polynomial $P(x) = x^2 - 3$.

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

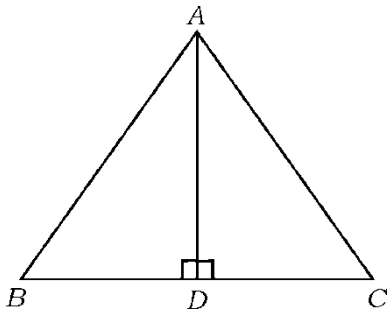
13. Find the value of the discriminant of the quadratic equation $2x^2 - 4x + 3 = 0$.

14. Write the formula to calculate the curved surface area of the frustum of a cone.

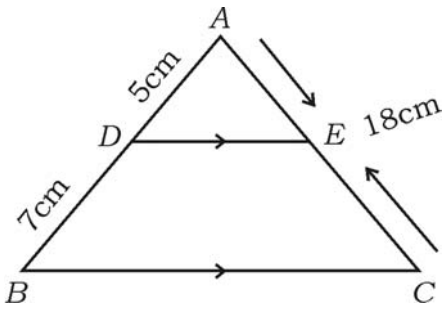
III. Answer the following :

15. Find the sum of first twenty terms of Arithmetic series $2 + 7 + 12 + \ldots$ using suitable formula. 2

16. In ΔABC, $AD \perp BC$ and $AD^2 = BD \times CD$, prove that $AB^2 + AC^2 = (BD + CD)^2$. 2

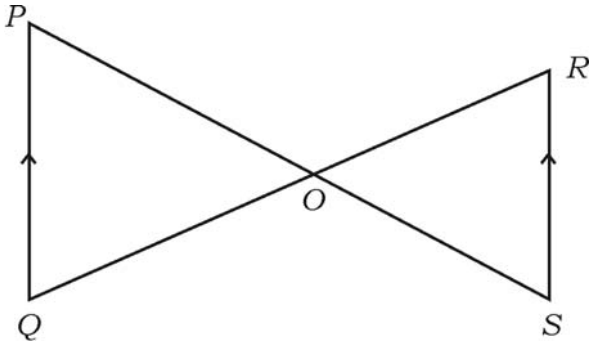


17. In ΔABC, $DE \parallel BC$. If $AD = 5$ cm, $BD = 7$ cm and $AC = 18$ cm, find the length of AE. 2



OR

In the given figure if $PQ \parallel RS$, prove that $\Delta POQ \sim \Delta SOR$.

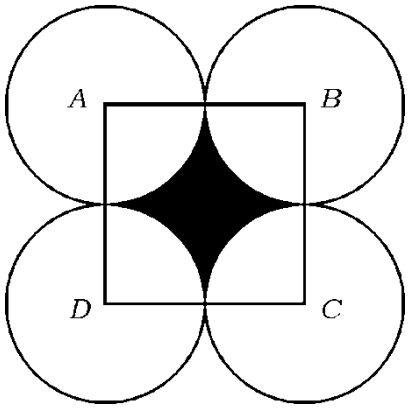


18. Solve the following pair of linear equations by any suitable method : 2

$x + y = 5$

$2x - 3y = 5.$

19. In the figure, *ABCD* is a square of side 14 cm. *A, B, C* and *D* are the centres of four congruent circles such that each circle touch externally two of the remaining three circles. Find the area of the shaded region. 2



20. Draw a circle of radius 4 cm and construct a pair of tangents such that the angle between them is 60°. 2

21. Find the co-ordinates of point which divides the line segment joining the points $A\ (4, -3)$ and $B\ (8, 5)$ in the ratio 3 : 1 internally. 2

22. Prove that $3 + \sqrt{5}$ is an irrational number. 2

23. The sum and product of the zeroes of a quadratic polynomial $P(x) = ax^2 + bx + c$ are -3 and 2 respectively. Show that $b + c = 5a$.

2

24. Find the quotient and the remainder when $P(x) = 3x^3 + x^2 + 2x + 5$ is divided by $g(x) = x^2 + 2x + 1$. 2

25. Solve $2x^2 - 5x + 3 = 0$ by using formula. 2

26. The length of a rectangular field is 3 times its breadth. If the area of the field is 147 sq.m find its length and breadth. 2

27. If $\sin\theta = \frac{12}{13}$ find the values of $\cos\theta$ and $\tan\theta$. 2

OR

If $\sqrt{3}\tan\theta = 1$ and θ is acute find the value of $\sin 3\theta + \cos 2\theta$.

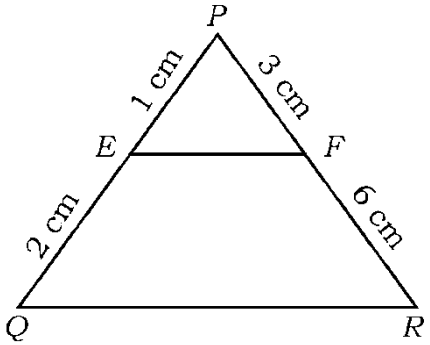
28. Prove that $\left(\frac{1+\cos\theta}{1-\cos\theta}\right) = (\text{cosec}\,\theta + \cot\theta)^2$. 2

29. A cubical die numbered from 1 to 6 is rolled twice. Find the probability of getting the sum of numbers on its faces is 10. 2

30. The radii of two circular ends of a frustum of a cone shaped dustbin are 15 cm and 8 cm. If its depth is 63 cm, find the volume of the dustbin. 2

31. If *x*, 13, *y* and 3 are in arithmetic progression, find the values of *x* and *y*. 2

32. In ΔPQR, *E* and *F* are points on *PQ* and *PR* respectively. If *PE* = 1 cm, *QE* = 2 cm, *PF* = 3 cm and *RF* = 6 cm, show that *EF* || *QR*. 2



33. Find the HCF and LCM of 6 and 20. 2

34. Draw a tangent to a circle of radius 3 cm from a point 5 cm away from its centre. 2

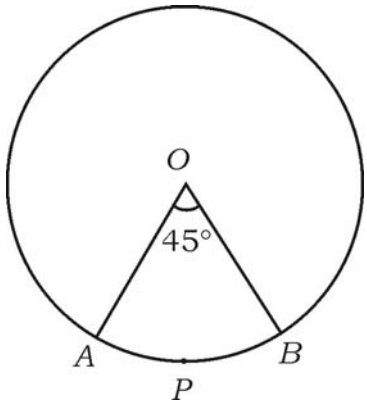
35. In a circle of radius 21 cm an arc subtends an angle of 60° at the centre. Find the length of the arc. 2

36. Express the given equation in the standard form $(x-2)^2+1 = 2x+3$.

2

37. Write the probability of sure event and impossible event. 2

38. Find the area of the sector of a circle with radius 4 cm and of angle 45°. (Use $\pi = 3{\cdot}14$). 2



39. Find the distance between (3, 4) from the origin. 2

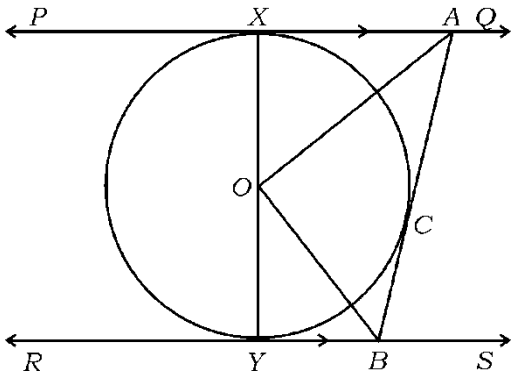
40. Two coins are tossed together. Find the probability of getting at least one head. 2

IV. Answer the following :

41. Prove that "the lengths of tangents drawn from an external point to a circle are equal". 3

OR

In the given figure *PQ* and *RS* are two parallel tangents to a circle with centre *O* and another tangent *AB* with point of contact *C* intersecting *PQ* at *A* and *RS* at *B*. Prove that $\angle AOB = 90°$.



42. Calculate the median of the following frequency distribution table : 3

Class-interval	*Frequency* (f_i)
1 — 4	6
4 — 7	30
7 — 10	40
10 — 13	16
13 — 16	4
16 — 19	4

$\Sigma f_i = 100$

OR

Calculate the mode for the following frequency distribution table.

Class-interval	*Frequency* (f_i)
10 — 25	2
25 — 40	3
40 — 55	7
55 — 70	6
70 — 85	6
85 — 100	6

$\Sigma f_i = 30$

43. During the medical check-up of 35 students of a class, their weights were recorded as follows. Draw a less than type of ogive for the given data : 3

Weight (in kg)	*Number of students*
Less than 38	0
Less than 40	3
Less than 42	5
Less than 44	9
Less than 46	14
Less than 48	28
Less than 50	32
Less than 52	35

44. The seventh term of an Arithmetic progression is four times its second term and twelveth term is 2 more than three times of its fourth term. Find the progression. 3

OR

A line segment is divided into four parts forming an Arithmetic progression. The sum of the lengths of 3rd and 4th parts is three times the sum of the lengths of first two. If the length of fourth part is 14 cm, find the total length of the line segment.

45. The vertices of a ΔABC are $A(-3, 2)$, $B(-1, -4)$ and $C(5, 2)$. If M and N are the mid-points of AB and AC respectively, show that $2MN = BC$. 3

OR

The vertices of a ΔABC are $A(-5, -1)$, $B(3, -5)$, $C(5, 2)$. Show that the area of the ΔABC is four times the area of the triangle formed by joining the mid-points of the sides of the triangle ABC.

46. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then construct another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle. 3

V. Answer the following :

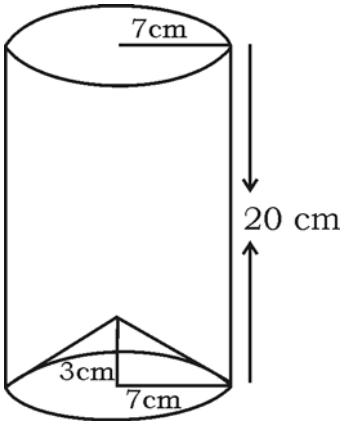
47. Find the solution of the following pairs of linear equation by the graphical method : 4

$$2x + y = 6$$

$$2x - y = 2$$

48. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Find the height of the tower. 4

49. The bottom of a right cylindrical shaped vessel made from metallic sheet is closed by a cone shaped vessel as shown in the figure. The radius of the circular base of the cylinder and radius of the circular base of the cone are each is equal to 7 cm. If the height of the cylinder is 20 cm and height of cone is 3 cm, calculate the cost of milk to fill completely this vessel at the rate of Rs. 20 per litre. 4



OR

A hemispherical vessel of radius 14 cm is fully filled with sand. This sand is poured on a level ground. The heap of sand forms a cone shape of height 7 cm. Calculate the area of ground occupied by the circular base of the heap of the sand.

50. Prove that "the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides". 4

D

SL. No. : P

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 50]
Total No. of Questions : 50]

[ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12
[Total No. of Printed Pages : 12

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UNREVISED

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

Code No. : 81-E

ವಿಷಯ : ಗಣಿತ

Subject : MATHEMATICS

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater)

ದಿನಾಂಕ : 25. 03. 2019]

[Date : 25. 03. 2019

ಸಮಯ : ಬೆಳಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ–12-45 ರವರೆಗೆ] [Time : 9-30 A.M. to 12-45 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 100]

[Max. Marks : 100

TEAR HERE TO OPEN THE QUESTION PAPER
ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಹರಿಯಿರಿ

General Instructions to the Candidate :

1. This Question Paper consists of 50 objective and subjective types of questions.
2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper at the time of commencement of the examination. Check whether all the pages of the question paper are intact.
3. Follow the instructions given against both the objective and subjective types of questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. 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.

Tear here

I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. If $A = \{ 4,\ 8,\ 12,\ 16,\ 20,\ 24 \}$ and $B = \{ 4,\ 20,\ 28 \}$ then $A \cap B$ is

   (A) $\{ 4,\ 8,\ 12,\ 16,\ 20,\ 24,\ 28 \}$

   (B) $\{ 4,\ 20 \}$

   (C) $\{ 28 \}$

   (D) $\{ \}$

2. The sum to infinite terms of a Geometric progression whose first term is a and common ratio r is given by the formula.

   (A) $S_\infty = \frac{a}{1-r}$ (B) $S_\infty = \frac{1-r}{a}$

   (C) $S_\infty = \frac{a}{1+r}$ (D) $S_\infty = a(1-r)$

3. If H and L are the HCF and LCM of two numbers A and B respectively then

   (A) $A \times H = L \times B$ (B) $A \times B = L \times H$

   (C) $A + B = L + H$ (D) $A + B = L - H$

4. The degree of the polynomial $P(x) = 2x^3 + 3x^2 - 11x + 6$ is

   (A) 2 (B) 6

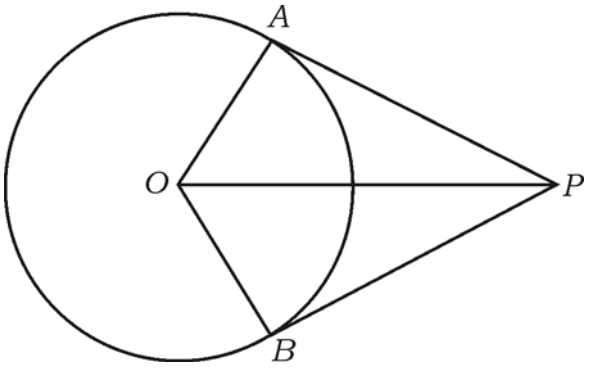
   (C) 3 (D) 4

5. The standard form of a quadratic equation is

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

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

6. In the given figure, $\overline{PA}$ and $\overline{PB}$ are the tangents to the circle with centre O. If $\angle AOB = 100°$, then $\angle APO$ is



(A) 50° (B) 80°

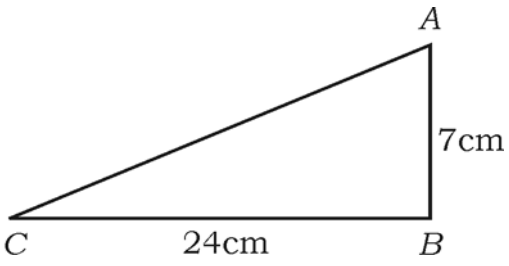
(C) 90° (D) 40°

7. The value of $\tan^2 60° + 2 \tan^2 45°$ is

(A) 5 (B) $\sqrt{3}+1$

(C) 4 (D) $\sqrt{3}+2$

8. In $\triangle ABC$ right angled at B, $\overline{AB}$ = 7 cm, $\overline{BC}$ = 24 cm. Then length of $\overline{AC}$ is



(A) 30 cm (B) 17 cm

(C) 25 cm (D) 19 cm

II. Answer the following questions : $6 \times 1 = 6$

9. Find the arithmetic mean of 16 and 20.

10. Find the value of ${}^{5}P_{3}$.

11. The probability of winning a game is 0·8. What is the probability of losing the same game ?

12. The Mean ($\bar{x}$) of certain scores is 60 and the standard deviation (σ) of the same scores is 3. Find the coefficient of variation of the scores.

13. Find the remainder obtained when $P(x) = 4x^2 - 7x + 9$ is divided by $(x - 2)$.

14. Write the discriminant of the quadratic equation $ax^2 + c = 0$.

III. Answer the following questions :

15. In a group of 60 people, 40 people like to read newspapers, 35 people like to read magazines and 26 people like to read both. Find the number of people who read neither newspapers nor magazines. 2

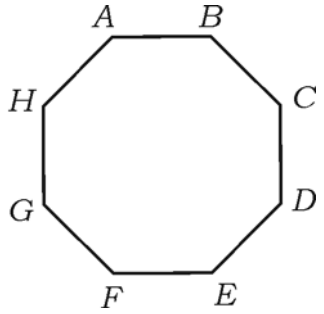
16. Find the tenth term of the progression $\frac{1}{5}, \frac{1}{3}, 1, -1, \ldots$. 2

17. Prove that $3 + \sqrt{5}$ is an irrational number. 2

18. a) State the fundamental principle of counting.

b) Write the value of 0 ! 2

19. Using a suitable formula calculate the number of diagonals that can be drawn in the given polygon. 2



20. In an experiment of tossing a fair coin twice, find the probability of getting

a) two heads

b) exactly one tail. 2

21. Find the product of $\sqrt[3]{2}$ and $\sqrt{3}$. 2

22. Rationalise the denominator and simplify : 2

$$\frac{\sqrt{3}}{\sqrt{3}+\sqrt{2}}$$

23. Find the quotient and the remainder using synthetic division : 2

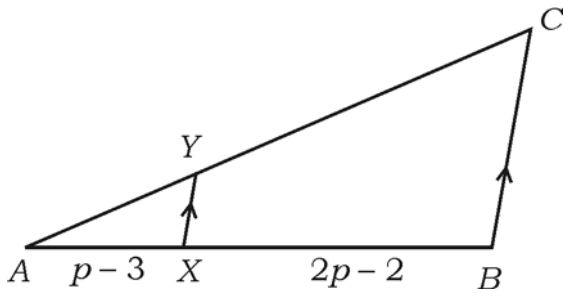
$(x^3 + x^2 - 3x + 5) \div (x - 1)$.

OR

If one of the zeros of the polynomial $x^2 - x - (2k + 2)$ is -4, find the value of k.

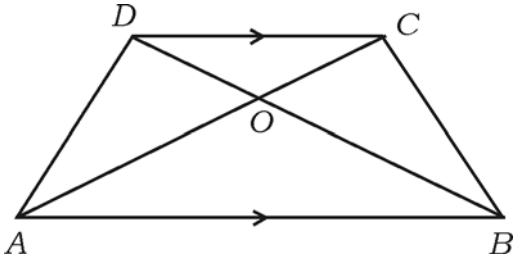
24. Draw a circle of radius 4 cm and construct a tangent at one end of its diameter. 2

25. In the following figure, $\overline{AX} = p - 3$, $\overline{BX} = 2p - 2$, $\frac{AY}{YC} = \frac{1}{4}$. Find p. 2



OR

In the trapezium $ABCD$, $\overline{AB} \parallel \overline{CD}$, $\overline{AB} = 2\overline{CD}$ and area of ΔAOB is 84 cm^2. Find the area of ΔCOD.



26. Given $\tan A = \frac{3}{4}$, find $\sin A$ and $\cos A$. 2

27. Find the equation of a line having angle of inclination 45° and y-intercept is 2. 2

28. Find the distance between the points $A(6, 5)$ and $B(4, 4)$. 2

29. The curved surface area of a right circular cone is 4070 cm^2 and its slant height is 37 cm. Find the radius of the base of the cone. 2

30. Draw a plan of a level ground using the information given below : 2

(Scale 20 m = 1 cm)

	Metre To C	
To D 100 To E 60	220 160 120 80	80 to B
	From A	

31. Given $U = \{ 5, 6, 8, 10, 12, 14, 16, 18 \}$, $A = \{ 5, 6, 8, 10 \}$ and $B = \{ 6, 8, 12, 14 \}$. Represent $(A \cup B)'$ by a Venn diagram. 2

32. If $T_n = n^2 + 4$ and $T_n = 200$, find the value of n. 2

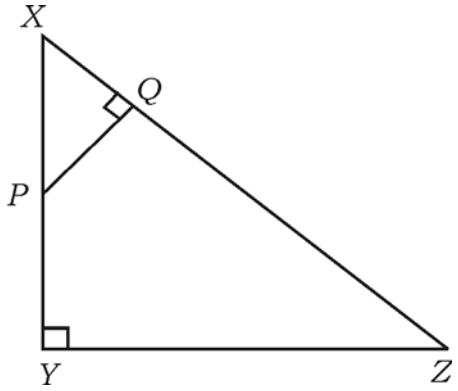
33. Find the sum of $\left(4\sqrt{x} + 6\sqrt{y} \right)$ and $\left(5\sqrt{x} - 3\sqrt{y} \right)$. 2

34. The number of students who are willing to join their favourite sports is given below. Draw a pie chart to represent the data : 2

Name of the sport	*Number of students*
Hockey	3
Football	6
Tennis	5
Basket Ball	4

35. Find the zeros of the polynomial $p (x) = x^2 + 14x + 48$. 2

36. In $\triangle XYZ$, P is a point on $\overline{XY}$ as shown in the figure. If $\overline{PQ} \perp \overline{XZ}$, $\overline{XP}$ = 4 cm, $\overline{XY}$ = 16 cm and $\overline{XZ}$ = 24 cm, find the length of $\overline{XQ}$. 2



37. Find the length of the diagonal of a square of side 12 cm. 2

38. Form the quadratic equation whose roots are 3 and 5. 2

39. Find the co-ordinates of the mid-point of the line joining the points (5, 6) and (– 3, 8). 2

40. If $\tan 2A = \cot (A - 18°)$, where $2A$ is an acute angle, then find the value of A. 2

IV. Answer the following questions :

41. Prove that the tangents drawn from an external point to a circle

a) are equal

b) subtend equal angles at the centre

c) are equally inclined to the line joining the centre and the external point. 3

42. The circumference of the circular base of a right cylindrical vessel is 132 cm and its height is 25 cm. Calculate the maximum quantity of water it can hold. (Use $\pi = \frac{22}{7}$). 3

OR

A solid metallic right circular cone is of height 20 cm and its base radius is 5 cm. This cone is melted and recast into a solid sphere. Find the radius of the sphere. (Use $\pi = \frac{22}{7}$).

43. Find the standard deviation for the following data : 3

Marks (x)	*Number of students (f)*
35	2
40	4
45	8
50	4
55	2

44. A building and a tower are on the same level ground. The angle of elevation of the top of the building from the foot of the tower is 30°. The angle of elevation of the top of the tower from the foot of the building is 60°. If the height of the tower is 50 m, then find the height of the building. 3

OR

Prove that $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$.

45. Solve by using formula : 3

$x^2 - 2x + 3 = 3x + 1.$

OR

If m and n are the roots of the quadratic equation $x^2 - 6x + 2 = 0$, then find the value of

a) $\frac{1}{m} + \frac{1}{n}$

b) $(m + n)(mn)$.

46. Prove that the area of an equilateral triangle of side 'a' units is $\frac{a^2\sqrt{3}}{4}$ square units. 3

OR

ΔABC is right angled triangle right angled at C. D is a point on the side $\overline{AC}$ and E is a point on the side $\overline{BC}$. Show that

$AB^2 + DE^2 = AE^2 + BD^2$.

V. Answer the following questions :

47. Construct direct common tangents to two circles of radii 4 cm and 2 cm whose centres are 8 cm apart. 4

48. Find the sum of first ten terms of an Arithmetic progression whose fourth term is 13 and eighth term is 29. 4

OR

Find the three consecutive terms of a Geometric progression whose sum is 14 and their product is 64.

49. Prove that "if two triangles are equiangular, then their corresponding sides are in proportion". 4

50. Solve graphically : $x^2 - x - 2 = 0$. 4