BUDHA DAL PUBLIC SCHOOL PATIALA

FINAL EXAMINATION (1 March 2025)

Class - IX

Paper-Mathematics (Set-A)

Time: 3hrs. **M.M. 80**

General Instructions:

1. This Question Paper has 5 Sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each respectively.

Section-A

1. Every rational number is

   a) a national b) a real number c) a whole number d) an integer

2. Rationalising factor for the denominator of the expression $\frac{1}{3+\sqrt{5}}$ is

   a) $3+\sqrt{5}$ b) $5-\sqrt{3}$ c) $\sqrt{3}-5$ d) $3-\sqrt{5}$

3. $\sqrt{5}$ is a polynomial of degree

   a) 2 b) 0 c) 1 d) $\frac{1}{2}$

4. The coefficient of y in the expansion of $(5-y)^2$ is

   a) 5 b) 10 c) -10 d) 1

5. If $(2, 0)$ is a solution of the linear equation $2x + 3y = k$

   a) 4 b) 6 c) 5 d) 2

6. Abscissa of the given point $(3, 6)$ is

   a) 6 b) 3 c) 0 d) none of these

7. Point $(-3, 5)$ lie in the

   a) I quadrant b) II quadrant c) III quadrant d) IV quadrant

8. The value of $(32)^{1/5}$

   a) 1 b) 2 c) 3 d) 4

9. The point which lie on the line $y = 2x$ is

   a) $(-2, -6)$ b) $(2, -4)$ c) $(-5, -10)$ d) $(-5, 10)$

10. The angle which exceeds its complement by 30^0 is

a) 150^0 b) 120^0 c) 60^0 d) 80^0

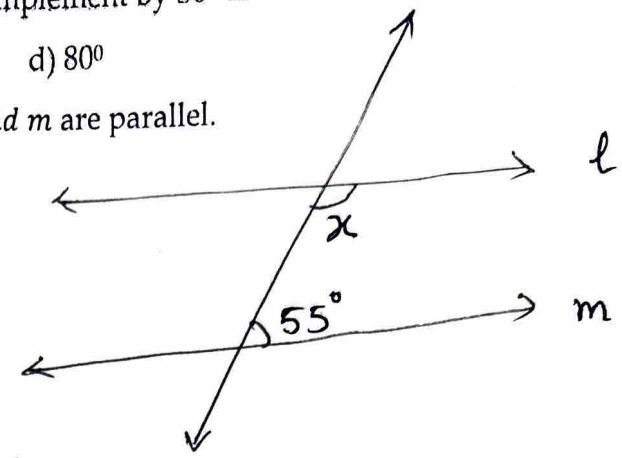
11. Value of x for which lines l *and* m are parallel.

a) 175^0

b) 125^0

c) 135^0

d) none of these



12. In $\Delta ABC, AB = AC$ *and* $\angle B = 50^0$, then $\angle C$ is equal to

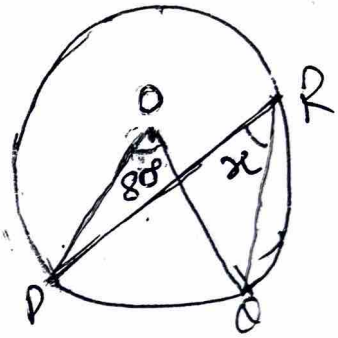
a) 40^0 b) 50^0 c) 80^0 d) 130^0

13. Three angles of a quadrilateral are 75^0, 90^0 and 75^0. The fourth angle is

a) 90^0 b) 95^0 c) 105^0 d) 120^0

14. In figure O is the centre of the circle, the value of x is

a) 80^0 b) 96^0 c) 40^0 d) 137^0



15. Area of an equilateral triangle with side m

b) $\frac{\sqrt{3}}{4} m^2$ b) $\frac{\sqrt{3}}{2} m$ c) $\frac{\sqrt{3}}{2} m^2$ d) $\frac{\sqrt{3}}{4} m$

16. Curved surface area of the cone with radius r is

a) $\pi r\,(r + l)$ b) $\pi\,(r - l)$ c) πrl d) $\pi r^2 l$

17. Volume of the right circular cone with radius 3.5cm and height 12cm.

a) 134 cm^3 b) 144 cm^3 c) 154 cm^3 d) 164 cm^3

18. The class mark of class 85 – 90 is

a) 85.5 b) 90 c) 87.5 d) 88.5

Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).

a) Both A and R are true and Reason (R) is correct explanation of A
b) Both A and R are true but Reason (R) is not the correct explanation of A
c) A is true but R is false
d) **A is false but R is true**

19. Assertion (A) : The degree of the polynomial $(x - 1)(x - 2)(x - 3)$ is 4.

Reason (R) : The number of zeros of a polynomial is the degree of that polynomial.

20. Assertion (A) : The curved surface area of a cone with base radius 3 cm and slant height 4 cm is 12 πcm^2

Reason (R): Curved surface are of cone = $\pi r^2 h$

Section - B

21. Show $\sqrt{5}$ on the number line.

22. Simplify $(5+\sqrt{7})(2-\sqrt{5})$

23. Find the value of m if $x-1$ is a factor of $p(x)=x^2+x+m$

24. Write linear equation in the form of $ax+by+c=0$ and indicate the values of a, b and c

$x-4=\sqrt{3}y$

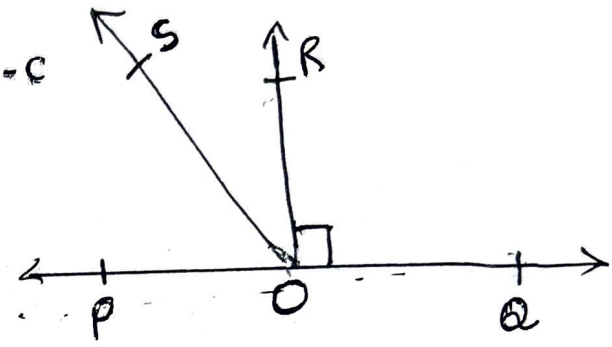
25. If a point C lies between two points A and B such that AC = BC, then prove that $AC=\frac{1}{2}AB$

Explain with figure.

Section - C

26. In figure POR is a line ray OR is perpendicular to line PQ. OS is another ray lying between ray OP and OR.

Prove $\angle ROS=\frac{1}{2}(\angle QOS-\angle POS)$



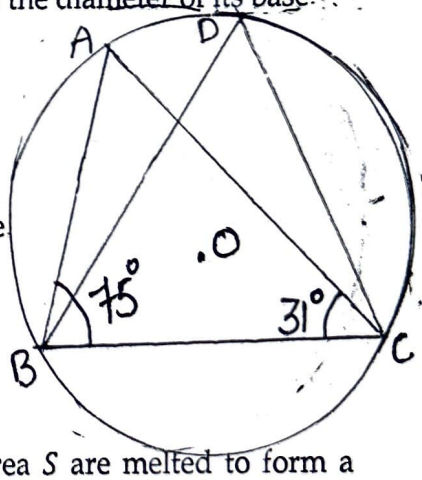
27. The perimeter of an isoscleles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of the triangle.

28. A hemispherical bowl made of steel has inner diameter 10.5cm. Find the cost of plating it on the inside at the rate of Rs. 15 per 100 cm^2.

29. If the volume of a right circular cone of height 9 cm is $75\pi\ cm^3$. Find the diameter of its base.

30. In the figure $\angle ABC=75^0, \angle ACB=31^0$,

find $\angle BDC$



31. Prove that equal chords of a circle subtend equal angles at the centre

Section - D

32. Find the values of a and b

$\frac{5+2\sqrt{3}}{7+4\sqrt{3}}=a-b\sqrt{3}$

33. Twenty seven solid iron spheres, each of radius r and surface area S are melted to form a sphere with surface area S'. Find (i) radius r' of the new sphere (ii) ratio of S and S'

34. In a city, the weekly observation made in a study on the cost of living index are given in the table.

Draw a frequency polygon for the data

Cost of Living Index	Number of Weeks
140 - 150	5
150 - 160	10
160 - 170	20
170 - 180	9
180 - 190	6
190 - 200	2
Total	52

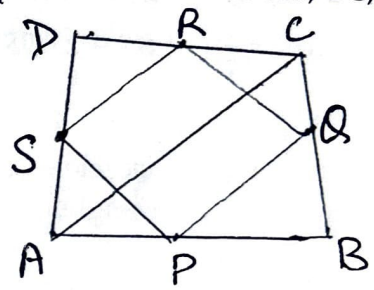
35. ABCD is a quadrilateral in which P, Q, R and S are mid points of the sides AB, BC, CD and DA.

AC is a diagonal. Show that

i) $SR \parallel AC \text{ and } SR = \frac{1}{2}AC$

ii) $PQ = SR$

iii) PQRS is a parallelogram



Section - E

Case Study:

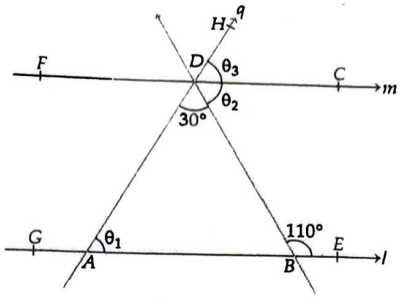
36. Green cleaning refers to using cleaning methods and products with environmentally friendly ingredients and procedures which are designed to preserve human health and environment quality. To preserve the environment and do in this manner, Ramesh made a slide in a park which is situated in his society. One of its side walls has been painted in some colour with a message 'KEEP THE PARK GREEN AND CLEAN'. If the sides of the wall are 15m, 11m and 6m, then give answer the questions by at looking the figure.

a) Write the Heron's formula to find the area of triangle. (1)

b) Find the semi-perimeter of triangle. (1)

c) Find the area (in m^2) of the wall. (2)

37. In game period, the teacher of Meerut Public School decided to play the puzzle game. For this game, firstly the teacher draw a geometrical figure on the ground, which is shown as below:



Here, line l is parallel to line m and line q is a transversal line. While drawing this figure, the teacher have no scale for measuring this length, but they know the side which is opposite to the smallest angle, is smaller and the side which is opposite to the largest angle, is larger. In this game, the teacher invite the two students Vicky and Vishal and said to them that specially Vicky stands on point A and Vishal stands on point B, respectively (assume that both have same space of walking). Then, answer the following questions, which are based on above data.

Based on above information answer the following questions:

a) Find the measure of $\angle\theta_2$ (1)

b) Find the measure of $\angle ABD$ (1)

c) Find the measure of $\angle\theta_1$ (2)

38. To recapitulate the concept of polynomials a teacher bought a box with some slips of polynomial written on them in the class. She asked the students to pick a slip turnwise and say any four lines about the polynomial written on it.

Based on above information answer the following questions:

a) (i) The polynomial written on Aparajita's slip was $p(t) = 4t^2 - 9 + t$. What is the value of $p(2)$? (1)

b) Saanvi got the polynomial $p(x) = 1 - x^2$. What type of polynomial is it? (1)

c) One of the slips had polynomial $x^2 - 6x + 9$ written on it. Write its factors. (2)

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Class – IX

Paper-Mathematics (Set-B)

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General Instructions:

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2. Section A has 20 MCQs carrying 1 mark each
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Section-A

1. Decimal representation of a rational number cannot be

   a) terminating b) non-terminating

   c) non terminating repeating d) non terminating non repeating

2. $\frac{1}{\sqrt{3}+\sqrt{2}}$ equals

   a) $\frac{\sqrt{3}-\sqrt{2}}{4}$ b) $\sqrt{3}+\sqrt{2}$ c) $\sqrt{3}-\sqrt{2}$ d) $\frac{\sqrt{3}-\sqrt{2}}{5}$

3. Degree of the zero polynomial is

   a) 0 b) 1 c) any natural number d) not defined

4. Zero of the polynomial $P(x) = 2x + 3$ is

   a) -3 b) 0 c) $\frac{3}{2}$ d) $-\frac{3}{2}$

5. If (0, 2) is a solution of the linear equation $2x + 3y = k$ then the value of k is

   a) 4 b) 6 c) 5 d) 2

6. Ordinate of the given point $(-2, -3)$ is

   a) -2 b) 2 c) -3 d) 3

7. Point $(-2, -4)$ lie in the

   a) I quadrant b) II quadrant c) III quadrant d) IV quadrant

8. The value of $2^{2/3} \times 2^{4/3}$ is

   a) 3 b) 2 c) 4 d) 0

9. The point which lie on the line $y = -3x$ is

   a) $(2, -7)$ b) $(3, -6)$ c) $(3, 9)$ d) $(3, -9)$

B - 1

10. If the difference between two supplementary angles is 40^0 , then angles are

a) $(65^0, 125^0)$ b) $(210^0, 150^0)$ c) $(70^0, 110^0)$ d) none of these

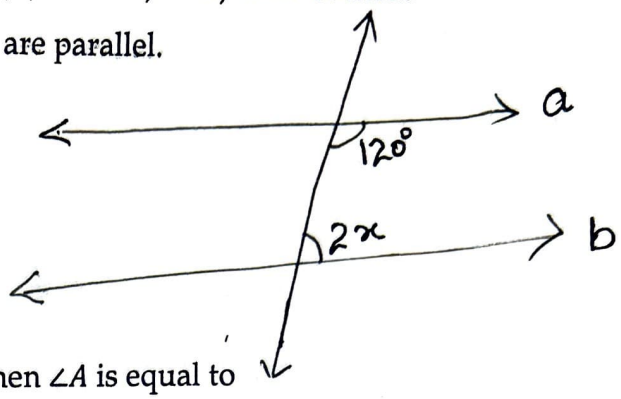
11. Value of m for which lines a and b are parallel.

a) 60^0

b) 70^0

c) 30^0

d) none of these



12. In $\Delta ABC, AB = BC$ and $\angle C = 80^0$, then $\angle A$ is equal to

a) 80^0 b) 40^0 c) 50^0 d) 100^0

13. A quadrilateral which has exactly one pair of parallel sides is

a) a rectangle b) a parallelogram c) trapizium d) a rhombus

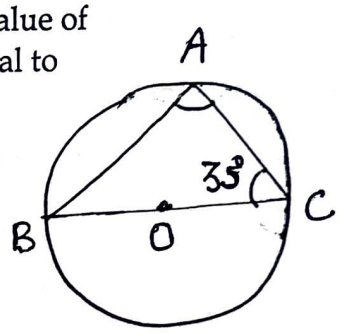
14. In figure O is the centre of the circle, the value of the circle if $\angle ACB = 35^0$, then $\angle ABC$ is equal to

a) 35^0

b) 55^0

c) 15^0

d) 45^0



15. Area of an equilateral triangle with side n is

a) $\frac{\sqrt{3}}{2} n^2$ b) $\frac{\sqrt{3}}{2} n$ c) $\frac{\sqrt{3}}{4} n^2$ d) $\frac{\sqrt{3}}{2} n$

16. Total surface area of the sphere with radius r is

a) $2\pi r^2$ b) $4\pi r^2$ c) $3\pi r^2$ d) πr^2

17. Slant height of a cone having radius r and height h is

a) $\sqrt{r^2 + h^2}$ b) $\sqrt{r^2 - h^2}$ c) $\sqrt{h^2 - r^2}$ d) none of these

18. The class mark of class 90 - 120 is

a) 90 b) 105 c) 115 d) 120

Direction: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R).

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19. Assertion (A) : The curved surface area of a cone with base radius 3 cm and height 4 cm is $12\ \pi cm^2$

Reason (R): Curved surface are of cone = $\pi r^2 h$

20. Assertion (A) : The degree of the polynomial $(x-1)(x-2)(x-3)$ is 4.

Reason (R) : The number of zeros of a polynomial is the degree of that polynomial.

Section - B

21. Show $\sqrt{2}$ on the number line.

22. Simplify $(\sqrt{11}+\sqrt{5})(\sqrt{11}-\sqrt{5})$

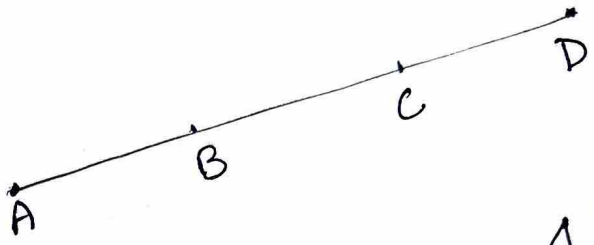
23. Find the value of k if $x-1$ is a factor of $4x^3+3x^2-4x+k$

24. Write linear equation in the form of $ax+by+c=0$ and indicate the values of a, b and c

$2x-\frac{y}{5}=10$

25. In figure if AC = BD.

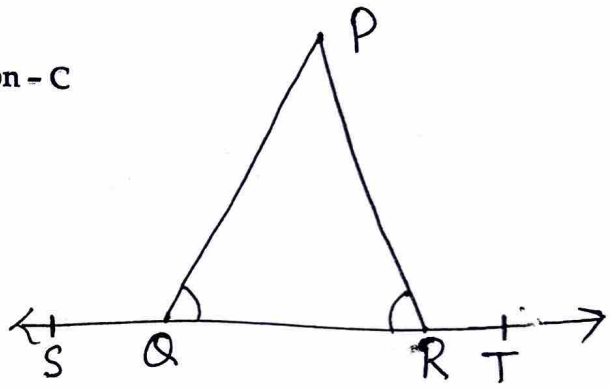
Then prove that AB = CD



Section - C

26. In figure $\angle PQR = \angle PRQ$,

then prove that $\angle PQS = \angle PRT$



27. The perimeter of an isosceles triangle is 32 cm. The ratio of the equal side to its base is 3 : 2. Find the area of the triangle.

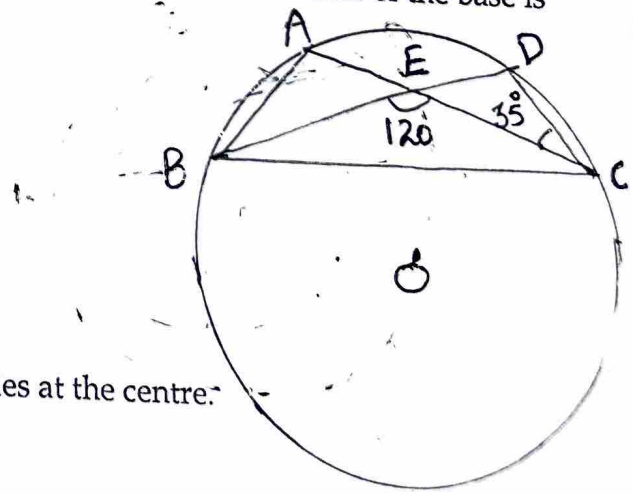
28. A hemispherical bowl made of brass 0.25 cm thick . The inner radius of the bowl is 5 cm. Find the outer curved surface area of the bowl.

29. Find the **height** and **slant height** of a cone whose volume 9856 cm^3 and diameter of the base is 28cm.

30. In the figure A, B C are four points on a circle

AC and BD intersect at appoint E such that

$\angle BEC = 120^0$ *and* $\angle ECD = 35^0$. Find $\angle BAC$



31. Prove that equal chords of a circle subtend equal angles at the centre.

32. Find the values of a and b

$\frac{3-\sqrt{5}}{3+2\sqrt{5}} = a\sqrt{5} - \frac{19}{11}b$

Section - D

33. Priya have a piece of convas whose area is 551m². She uses it to have a conical tent made with a base radius of 7cm. Assuming that all the stitching margins and the wastage incurred while cutting amounts to approximately 1m², find the volume of the tent that can be made with it.

34. The following table gives the life times of 50 neon lamps.

Draw a frequency polygon for the data

Life Time	Number of lamps
140 - 150	4
150 - 160	12
160 - 170	18
170 - 180	8
180 - 190	6
190 - 200	2
Total	**50**

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AC is a diagonal. Show that

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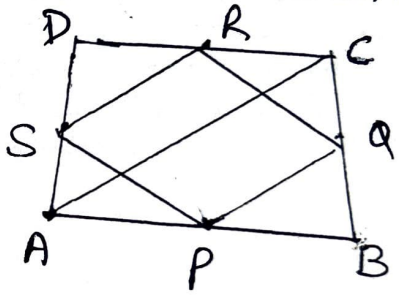

Section - E

Case Study:

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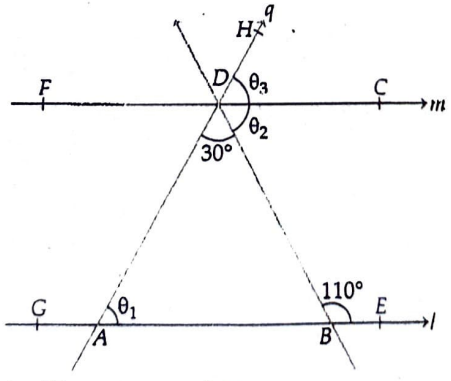

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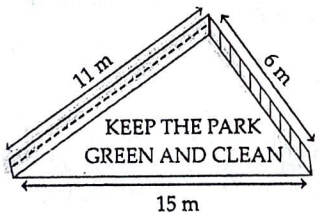

a) Write the Heron's formula to find the area of triangle. (1)

b) Find the semi-perimeter of triangle. (1)

c) Find the area (in m^2) of the wall. (2)