A.P. Board (Internal) Examination 2025-26
Class -IX (Nine)
Sub: - Mathematics

Time: 3 Hrs.   Max. Marks: 80

General Instruction:-

(i). All questions are compulsory.

(ii) The question paper consists of **40** questions divided into **four section: A, B, C and D.**

Section - A comprises **20** questions of **1** mark each.

Section - B comprises **6** questions of **2** mark each.

Section - C comprises **8** questions of **3** mark each.

Section - D comprises **6** questions of **4** mark each.

SECTION-A

(Question 1 to 20 carry 1 Mark each)

1. The sum of the measures of the angles of a quadrilateral is

    (a) 180^0 (b) 90^0 (c) 360^0 (d) 270^0

2. The additive identity for rational numbers is:

    (a) 1   (b) 0   (c) 2   (d) -1

3. The linear equation $3x - 4y = 5$ has

    (a) a unique solution   (b) Two solution   (c) Infinity many solutions   (d) No solution

4. In a parallelogram ABCD, If angle A and angle B are in the ratio 1 : 2, then angle A is:

    (a) 30^0 (b) 45^0 (c) 90^0 (d) 60^0

5. Point $(-8, 3)$ lies in the

    (a) First quadrant   (b) Second quadrant

    (c) Third Quadrant   (d) Fourth quadrant

6. Dividing $12xy(9x^2 - 16y^2)$ by $4xy(3x - 4y)$, we get

    (a) $3(3x - 4y)$ (b) $3(4x - 3y)$ (c) $3(4x + 3y)$ (d) $3(3x + 4y)$

7. The diagonals of a rhombus are 7.5cm and 16cm. The area of rhombus is

    (a) $45cm^2$ (b) $50cm^2$ (c) $55cm^2$ (d) $60cm^2$

8. Each angle of an equilateral triangle is:

    (a) 45^0 (b) 90^0 (c) 60^0 (d) 30^0

9. Which of the following is not a parallelogram?

    (a) Trapezium   (b) Square   (c) Rectangle   (d) Rhombus

10. The total surface area of a cube is 96cm². The volume of the cube is:

(a) $8cm^3$ (b) $512cm^3$ (c) $64cm^3$ (d) $27cm^3$

11. The collection of rational and irrirational numbers is called.

(a) Real numbers   (b) Integers   (c) Whole numbers   (d) Natural numbers

12. The degree of the polynomial $2 - 9y^2 - y^5 + 2y^8$ is:

(a) 2   (b) 8   (c) 5   (d) −9

13. $6\sqrt{5} \times 2\sqrt{5} =$ _____

(a) $12\sqrt{5}$ (b) 60   (c) 40   (d) 12

14. If $x + y + z = 0$, then $x^3 + y^3 + z^3$ is equal is

(a) 0   (b) abc   (c) 3abc   (d) 2abc

15. The class mark of the class 90-120 is

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

16. The value of $\left(\frac{1}{2}\right)^{-3} + \left(\frac{1}{3}\right)^{-2} + \left(\frac{1}{4}\right)^{-2}$ is

(a) 25   (b) 29   (c) $\left(\frac{1}{9}\right)^{-2}$ (d) 33

17. Which of the following is a true statement?

(a) Every natural number is a whole number

(b) Every integer is a whole number

(c) Every rational number is an integer

(d) Every real number is an irrirational number

18. An angle which is greater than 180^0 but less than 360^0 is called

(a) Acute angle   (b) Obtuse angle   (c) Right angle   (d) Reflex angle

19. The co-ordinate of the origin are:

(a) (0, 0)   (b) (1, 0)   (c) (0, 1)   (d) (1, 1)

20. The longest chord of a circle is:

(a) Diameter   (b) Radius   (c) Segment   (d) Sector

Section-B

### (Question 21 to 26 carry 2 marks each)

21. Expand $(3a + 4b + 5c)^2$

22. Prove that a cyclic parallelogram is a rectangle.

23. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent the above statement. (Take the cost of a notebook to be ₹x and that of a pen to be ₹y.

24. Simplify: $(\sqrt{11} + \sqrt{7})(\sqrt{11} - \sqrt{7})$.

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 by drawing the figure.

26. Find the surface area of a sphere of radius 7cm.

Section - C
(Question 27 to 34 carry 3 marks each)

27. Find $P(O)$, $P(2)$ and $P(-2)$ for the polynomial $P(x) = 2x^2 - 3x + 10$.

28. A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also at a point on the major arc.

29. Express $0.001001001.....$ in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

30. Find the area of a triangle two sides of which are 18cm and 10cm and the perimeter is 42cm.

31. In quadrilateral ACBD, $AC = AD$ and AB bisects $\angle A$.
Show that $\triangle ABC \cong \triangle ABD$.
What can you say about BC and BD?
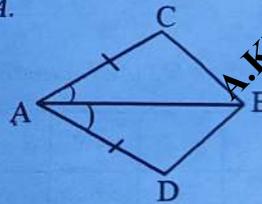
32. In figure, $\angle PQR = \angle PRQ$, then prove that $\angle PQS = \angle PRT$
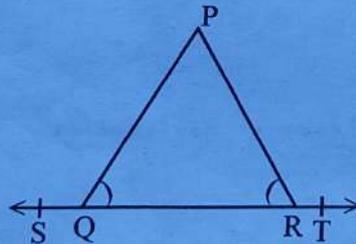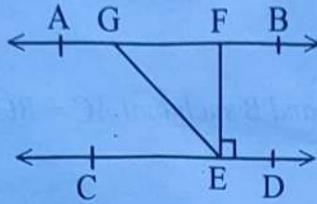

33. A Jocker's cap is in the form of a right circular cone of base radius 7cm and height 24cm. Find the area of the sheet required to make 10 such caps.

34. Find the value of k, if $x - 1$ is a factor of $p(x) = kx^2 - 3x + k$.
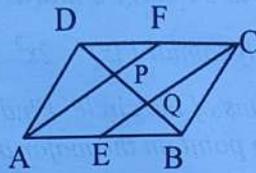
Section - D
(Question 35 to 40 carry 4 marks each)

35. Verify: (i) $x^3 + y^3 = (x + y)(x^2 - xy + y^2)$
   (ii) $x^3 - y^3 = (x - y)(x^2 + xy + y^2)$.

-3-

36. In the figure, if AB || CD, EF ⊥ CD and ∠GED = 126°, find ∠AGE, ∠GEF and ∠FGE.

37. In a parallelogram ABCD, E & F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisects the diagonal BD

38. Find four different solutions of the equation

    $x + 2y = 6$.

39. The diameter of a metallic ball is 4.2cm. What is the Mass of the ball, If the density of the metal is 8.9g per cm³.

40. Draw a histogram for the following data.

Age in years	0–4	4–8	8–12	12–16	16–20	20–24	24–28
No. of Persons	3	6	8	10	8	5	3

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Time: 3 Hrs.

Max. Marks: 80

Marking Scheme

Section - A

(Question 1 to 20 carry 1 mark each)

1. (c) 360^0	2. (b) 0	3. (c) Infinity many solutions.
4. (d) 60^0	5. (b) Second quadrant	6. (d) $3(3x + 4y)$
7. (d) $60cm^2$	8. (c) 60^0	9. (a) Trapizum
19. (c) $64cm^3$	11. (a) Real numbers	12. (b) 8
13. (b) 60	14. (c) 3abc	15. (b) 105
16. (d) 33	17. (a) Every natural number is a whole number	
18. (d) Reflex angle	19. (a) (0, 0)	20. (a) Diameter

21. $(x + y + z)^2 = x^2 + y^2 + z^2 + 2xy + 2yz + 2zx$ 1/2

$(3z + 4b + 5c)^2 = (3a)^2 + (4b)^2 + (5c)^2 + 2 \times 3a \times 4b + 2 \times 4b \times 5c + 2 \times 5c \times 3a$ (1)

$= 9a^2 + 16b^2 + 25c^2 + 24ab + 40bc + 30ca.$ 1/2

22. Given: ABCD is cyclic $\angle A + \angle C = 180^0$ ....(1)   (1)

ad ABCD is a parallelogram $\angle A = \angle C$ ....(2)

from (1) & (2) $\Rightarrow \angle C + \angle C = 180^0$

$\Rightarrow 2\angle C = 180^0$

$\Rightarrow C = 180^0/2$

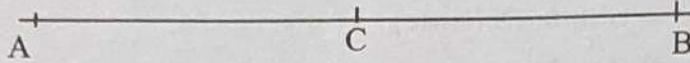$\Rightarrow C = 90^0$

ABCD is a rectangle
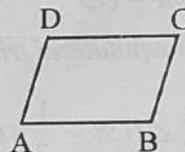
23. Cost of a notebook = ₹x

Cost of a pen = ₹y   (1)

$x = 2y$ or $x - 2y = 0$ (1)

24. $(x + y) (x - y) = x^2 - y^2$ 1/2

$(\sqrt{11} + \sqrt{7})(\sqrt{11} - \sqrt{7}) = (\sqrt{11})^2 - (\sqrt{7})^2$

$= 11 - 7$

$= 4$ 1½

25.

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+————————————+————————————————+
A            C                B
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Given : AC = BC $\Rightarrow$ *AC + AC = BC + AC*

$\Rightarrow$ *2AC = AB*

$\Rightarrow$ *AC = AB/2*

26. *Given: Radius of sphere = 7cm*

Surface area of sphere = $4\pi r^2$

$= 4\pi \times (7cm)^2$

$= 4 \times \dfrac{22}{7} \times 7 \times 7\ cm^2$

$= 88 \times 7\ cm^2$

$= 616\ cm^2$

Section - C

(Question 27 to 34 carry 3 marks 3ach)

27. $p(x) = 2x^2 - 3x + 10$

$p(0) = 2 \times 0^2 - 3x + 10 = 10$

$p(1) = 2 \times 1^2 - 3 \times 1 + 10 = 9$

$p(2) = 2 \times 2^2 - 3 \times 2 + 10 = 12$

28. *Given, AB = OA = OB*

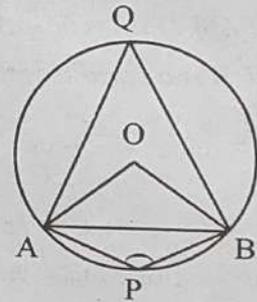$\therefore$ *$\triangle AOB$ is an equilateral triangle* $\Rightarrow \angle AOB = 60^0$.

$\therefore \angle APB = \dfrac{1}{2} \angle AOB = \dfrac{1}{2} \times 60^0$

$= 30^0$

Here, AQBP is a cylic quadrilateral

$\angle APB + \angle AQB = 180^0 = 30^0 + \angle AQB = 180^0$

$\angle AQB = 150^0$

29. *Let x = 0.001001001 .... (1)*

Multiply LHS and RHS by 1000,

1000 $\times$ x = 1000 $\times$ 0.001001001 .....

1000x = 1.001001001 .... (2)

(2) - (1) = 1000x - x = 1.001001001 .... - 0.001001001....

999x = 1

x = 1/999

-2-

30. Given $a = 18cm$, $b = 10cm$ and

Perimeter of triangle $= 42cm$

$a + b + c = 42cm$, $28cm + c = 42cm$

$c = 14cm$

$$S = \frac{a+b+c}{2} = \frac{42}{2}cm = 21cm$$

using Heron's formula.

Area of triangle $= \sqrt{s(s-a)(s-b)(s-c)}$

$$= \sqrt{21cm(21cm-18cm)(21cm-10cm)(21cm-14cm)}$$

$$= \sqrt{21cm(3cm)(11cm)(7cm)}$$

$$= 21\sqrt{11}\ cm^2$$

31. Given, $AC = AD$, AB bisects $\angle A \Rightarrow \angle CAB = \angle DAB$

In $\triangle ABC$ and $\triangle ABD$, $AC = AD$ (given)

$\angle CAB = \angle DAB$ (AB bisects $\angle A$), $Ab = Ab$ (commom)

$\therefore \triangle ABC \cong \triangle ABD$ (SAS congrunce rule)

$BC = BD$ (CPCT)

32. Given, $\angle PQR = \angle PRQ$

$\angle PQS + \angle PQR = 180^0$ (Linear Pair)

$\angle PQS + \angle PRQ = 180^0$ -------------------- ((1)

$\angle PRQ + \angle PRT = 180^0$ (Linear Pair) .... (2)

from (1) and (2);

$\angle PQS + \angle PRQ = \angle PRQ + \angle PRT$

$\angle PQS = \angle PRT$

33. Given, $r = 7cm$, $h = 24cm$

$$l = \sqrt{r^2 + h^2} = \sqrt{(7cm)^2 + (24cm)^2} = \sqrt{49cm^2 + 576cm^2}$$

$$= \sqrt{625cm^2} = 25cm$$

Area of the sheet required to make

10caps $= 10 \times \pi r \times l$

$$= 10 \times \frac{22}{7} \times 7cm \times 25cm\ ,\qquad = 5500\ cm^2$$

-3-

34. Given, $x - 1$ is a factor of $p(x) = kx^2 - 3x + k$

If $x - 1$ is a factor of $p(x)$, then by factor theorem,

$p(1) = 0$ *1*

i.e. $k \times 1^2 - 3 \times 1 + k = 0, \ k - 3 + k = 0$

$2k - 3 = 0, \Rightarrow k = \dfrac{3}{2}$ *2*

Section - D

(Question 35 to 40 carry 4 marks each)

35. (i) $LHS = x^3 + y^3$

     $RHS = (x + y)(x^2 - xy + y^2)$

            $= x^3 - x^2y + xy^2 + yx^2 - xy^2 + y^3$

            $= x^3 + y^3$

         $LHS = RHS$, Hence verified

     (ii) $LHS = x^3 - y^3$

     $RHS = (x - y)(x^2 + xy + y^2)$

            $= x^3 + x^2y + xy^2 - yx^2 - xy^2 - y^3$

            $= x^3 - y^3$

         $LHS = RHS$, Hence verified   *2*

36. Given, $AB \parallel CD$, $EF \perp CD$, $\angle GED = 126^0$

     $\angle AGE = \angle GED$ (Alternate interior angles)

         $= 126^0$ *1*

     $\angle GEF = \angle GED - \angle FED$

         $= 126^0 - 90^0, \ = 36^0$ *1½*

     $\angle FGE = 180^0 - AGE$ (linear pair)

         $180^0 - 126^0, \ = 54^0$ *1½*

37. Given, E and F are the mid points of AB and CD

     ABCD is a parallelogram

     $FC \parallel AE$ and $FC = AE \Rightarrow AECF$ is a parallelogram.

     In ΔDQC,

     If F is the mid-point of DC and $PF \parallel QC$, then by converse of mid-point theorem,

     p is the mid-point of DQ.

     i.e. $DP = PQ$ ----------- (1)   *1½*

     In ΔAPB,

If E is the mid-point of AB and AP || EQ, then by converse of mid-poin theorem,

Q is the mid-point of PB.

i.e. PQ = QB................ (2)   1½

From (1) and (2);

DP = PQ = QB ⇒ AF & EC trisects BD   ½

38. $x + 2y = 6$

(i) Put, x = 0, 0 + 2y = 6, y = 6/2, y = 3

(0, 3)   1

(ii) Put y = 0,   x + 2x0 = 6, x = 6

(6, 0)   1

(iii) Put y = 1, x + 2x1 = 6,   x = 6 - 2, x = 4

(4, 1)   1

(iv) Put x = 4,   -4 + 2y = 6, 2y = 10, y = 5

(-4, 5)   1

39. Given, d = 4.2cm, r = 2.1cm

Value of metallic ball $= \dfrac{4}{3}\pi r^3$

$$= \dfrac{4}{3} \times \dfrac{22}{7} \times (2.1cm)^3 ,\ \dfrac{88}{21} \times 2.1cm \times 2.1cm \times 2.1cm$$

$= 38.808\ cm^3$ 2

The density of the metal per cm³ = 8.9g

Mass of the ball = 38.808 x 8.9g

$= 345.39g$ 2

40. Graph   4

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