MATHEMTICS – IX

Self Assessment Paper

1

Section 'A'

Question 1 to 10 carry 1 mark each. Each question has four alternate answers of which only one is correct. Choose the correct answer.

1. Decimal representation of a rational number cannot be
   (a) terminating
   (b) non-terminating
   (c) non-terminating repeating
   (d) non-terminating non-repeating

   OR

   The value of $x^{a-b} \times x^{b-c} \times x^{c-a}$ is
   (a) 0
   (b) 1
   (c) 2
   (d) x.

2. One of the zeroes of the polynomial $2x^2 + 7x - 4$ is
   (a) 2
   (b) $\dfrac{1}{2}$
   (c) $-\dfrac{1}{2}$
   (d) -2

   OR

   One of the factors of the expression $[4x^3 - 32]$ is:
   (a) $(x^2 + 2x + 4)$
   (b) $x^2 - 2x + 4$
   (c) $(x^2 - 2x - 4)$
   (d) None of these

3. The points (others than origin) for which abscissa is equal to the ordinate will lie in
   (a) I quadrant only
   (b) II quadrant only
   (c) I and III quadrant
   (d) IV quadrant only

4. The perpendicular distance of the point P (4,7) from the y axis is
   (a) 4
   (b) 3
   (c) 2
   (d) 1

5. In an isosceles triangle, each of the base angles is double the vertical. Then, the measure of the vertical angle is:
   (a) $35°$
   (b) $36°$
   (c) $45°$
   (d) None of these

6. The length of the longest rod that can be placed in a room of dimensions (10 m × 8 m × 6 m) is
   (a) 10 m
   (b) $10\sqrt{2}$ m
   (c) 24 m
   (d) 480 m.

   OR

   The curved surface area of a cylindrical pillar is 264 m^2 and its volume is 924 m^3. Then, the ratio of its diameter to its height is:
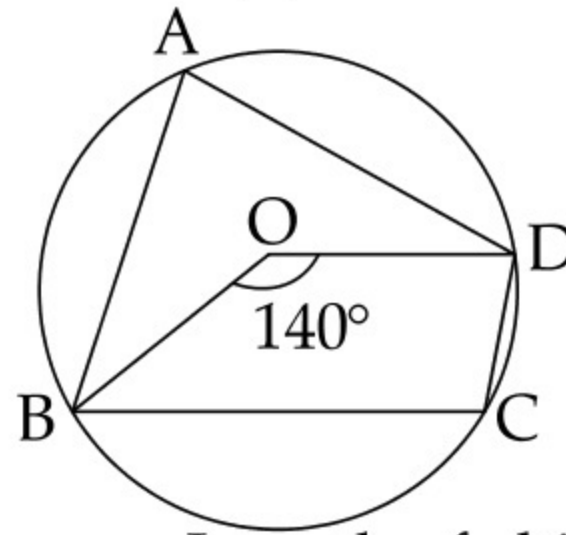   (a) 7 : 3
   (b) 3 : 7
   (c) 7 : 6
   (d) 6 : 7

7. If p is the probability of occurrence of an event E, then
   (a) $p \leq 1$
   (b) $p \geq 0$
   (c) $0 \leq p \leq 1$
   (d) $0 < p < 1$

8. O is the center of the circle and arc $\overset{\frown}{BCD}$ subtends an angle of $140°$ at the center O. Then, the measure of $\angle BCD$ is

(a) $80°$ (b) $160°$

(c) $110°$ (d) $120°$

9. In the given fig. ABCD is a parallelogram. Length of altitude AE is
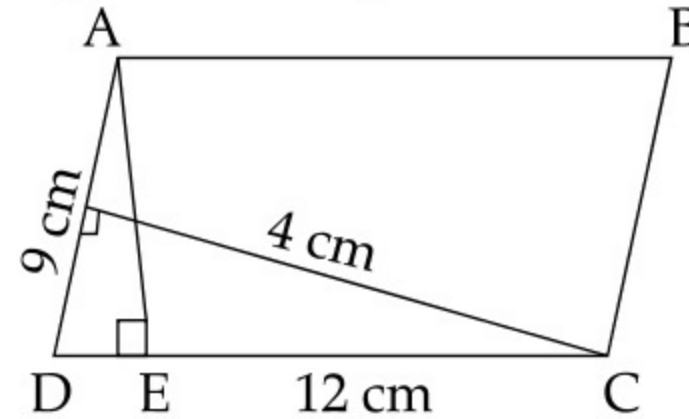
(a) 3 cm   (b) 6 cm

(c) 9 cm   (d) 2 cm
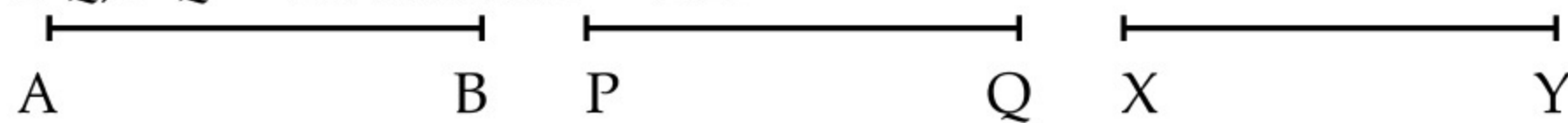
10. If in a quadrilateral diagonals are drawn and these diagonals are perpendicular, then the quadrilateral is a

(a) trapezium   (b) parallelogram
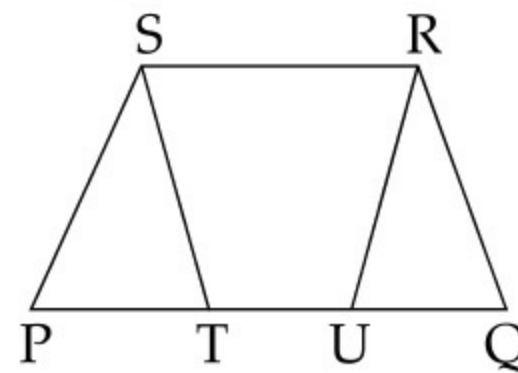
(c) rhombus   (d) rectangle

Questions 11 to 15 carry one mark each. State true or false.

11. Square root of every positive integer is irrational.

12. In the fig., if AB = PQ, PQ = XY then AB = XY.

13. PQRS is a trapezium with PQ || SR, PS || RU, and ST || RQ. Then, ar (PURS) = ar (QTSR).

14. The area of the isosceles triangle is $\dfrac{5}{4}\sqrt{11}\ \text{cm}^2$, if the perimeter is 11 cm and the base is 5 cm.

15. The diagonals of a rectangle are not perpendicular.

OR

In a parallelogram the opposite angles are supplementary

Questions 16 to 20 carry one mark each

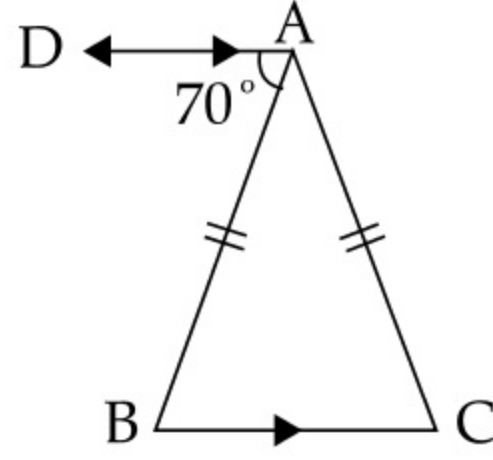**16.** Name the polynomial containing two non-zero terms.

OR

If $x + 1$ is a factor of $ax^3 + x^2 - 2x + 4a - 9$, find the value of a.

17. In ΔABC, if AB = AC and ∠B = 70°, Find ∠A.

<div align="center">OR</div>

In fig. it is given that $AB = AC$ and $DA \parallel BC$. If $\angle DAB = 70°$, then the measure of $\angle BAC$ is:

(a) 40°   (b) 50°

(c) 60°   (d) None of these

18. Can the angles 110°, 80°, 70° and 95° be the angles of a quadrilateral? why or why not?

19. The diameter of a football is five times the diameter of a cricket ball. Ratio of surface areas of football and cricket ball is ....

20. The sides of a triangular plot are in the ratio 4 : 5 : 6 and its perimeter is 150 cm, then find its sides.

Section 'B'

Question number 21 to 26 carry 2 marks each.

21. Is $\dfrac{\sqrt{98}}{\sqrt{2}}$ a rational number or not ? justify your answer
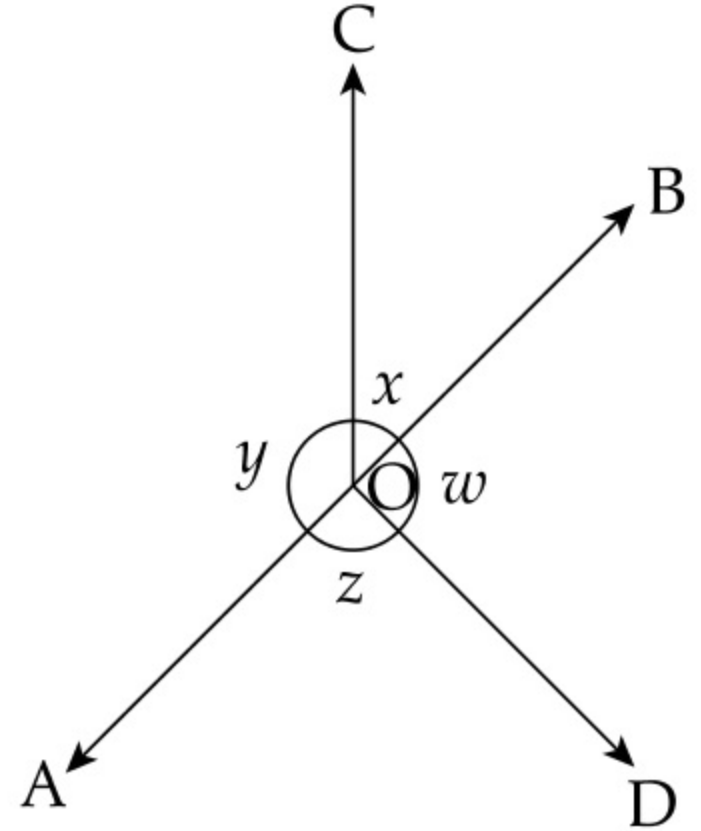
<div align="center">OR</div>

Write the simplest form of a rational number $\dfrac{177}{413}$.

22. Prove that every line segment has one and only one mid-point.

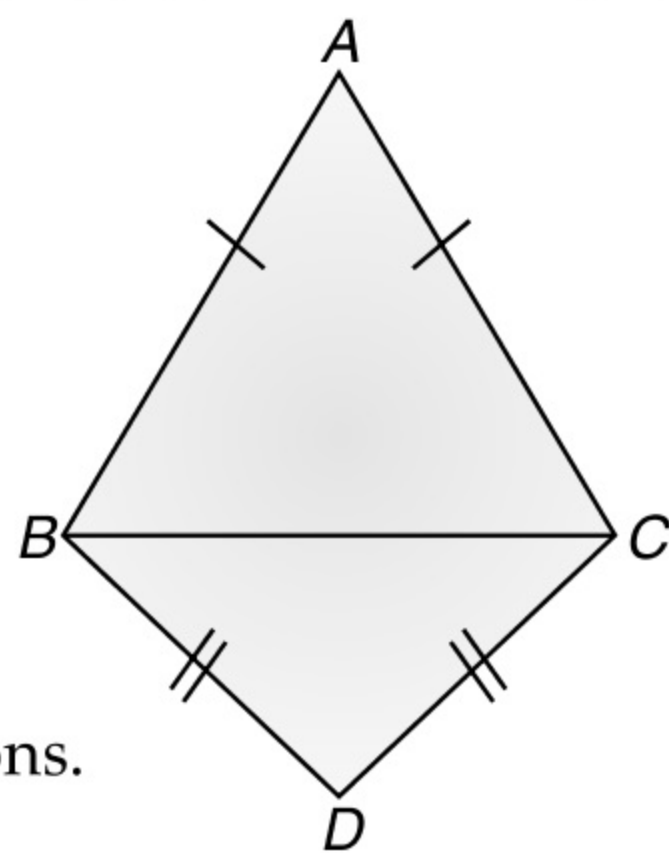**23.** What is the measure of an angle which is complement of itself ?

<div align="center">OR</div>

In the given fig. If $x + y = w + z$, then prove that AOB is line

24. In the figure, ΔABC and ΔDBC are two isosceles triangles on the same base BC. Prove that ∠ABD = ∠ACD.

25. The sides of triangle are 12 cm, 16 cm and 20 cm. Find its area.

26. If the mean of the observations :

$x, x + 3, x + 5, x + 7, x + 10$ is 9, then Find mean of the last three observations.

Question 27 to 34 carry 3 marks each

27. Prove that: $\dfrac{a^{-1}}{a^{-1}+b^{-1}} + \dfrac{a^{-1}}{a^{-1}-b^{-1}} = \dfrac{-\left(2b^2\right)}{a^2-b^2}$.

28. Give the equation of a line passing through (2, 14) and origin. How many more such lines are there ? Write the equation in the form $ax + by + c = 0$.

29. Plot a point P(2, 4) on the graph paper. Now, plot reflections of P by x axis and y axis and denote them as Q and R respectively. Name the type of triangle PQR so formed.

30. In the given parallelogram ABCD, two points P and Q are taken on the diagonal BD such that DP = BQ. Show that :
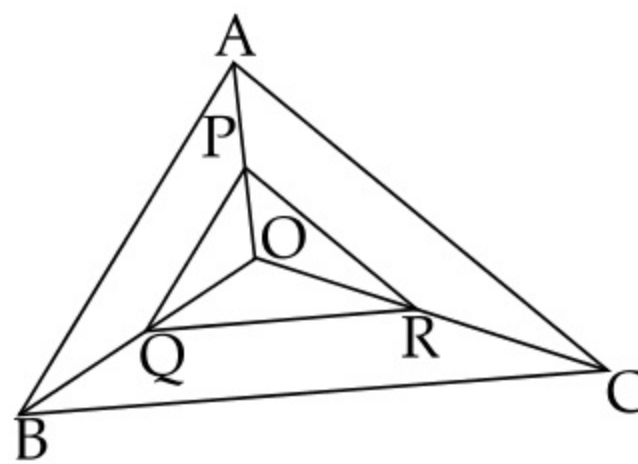
    (i) $\Delta APD \cong \Delta CQB$

    (ii) $\Delta AQB \cong \Delta CPD$

    (iii) APCQ is a parallelogram.
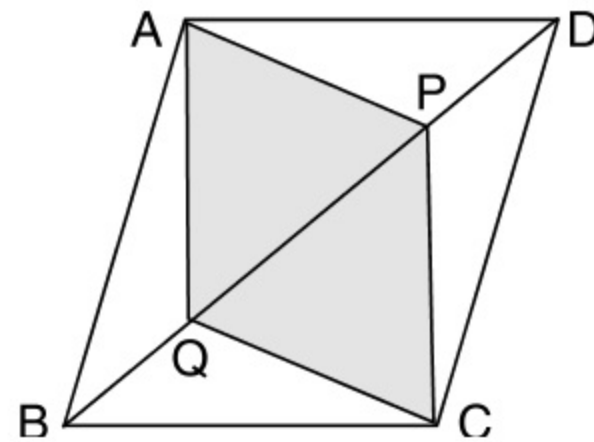
31. MNOP is a parallelogram and PN is one of its diagonals show that ar(ΔPMN) = ar(ΔPON).

OR

ABC is an equilateral triangle with perimeter 30 cm. P, Q and R are the mid-points of AO, BO and CO as shown in Fig. Find ar (ΔPQR).

Prove that a circle drawn on any one of the equal sides of an isosceles triangle as diameter, bisects the third side.

33. Find the area of triangular field of sides 18 m, 24 m and 30 m. Also find the altitude corresponding to the shortest side.

34. The marks obtained by 30 students in a competitive exam are given below :

Marks	70	58	61	52	65	75	68
No. of Students	3	5	4	7	6	2	3

One student is chosen at random. Find the probability

(a) that the student scored more than 65 marks.

(b) that the marks scored by the students is an odd number.

OR

Three coins were tossed 30 times simultaneously. Each time the number of heads occurring was noted down as follows :

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0   1   2   2   1   2   3   1   3   0
1   3   1   1   2   2   0   1   2   1
3   0   0   1   1   2   3   2   2   0
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Prepare frequency distribution table for the data given above. Find the no of heads occurs in which head has maximum frequency

Question 35 to 40 carry 4 marks each

35. Prove that :

$$\frac{1}{3-\sqrt{8}} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} = 5$$

36. Find the value of p if the polynomial $p(x) = x^4 - 2x^3 + 3x^2 - px + 3p - 7$ is divided by $(x + 1)$ leaves the remainder 19. Also find the remainder when $p(x)$ is divided by $x + 2$.

OR

Using factor theorem, show that $(m - n)$, $(n - p)$ and $(p - m)$ are factors of $m(n^2 - p^2) + n(p^2 - m^2) + p(m^2 - n^2)$.

37. Fahrenheit (F) and Celsius (C) are two different units of temperatures and relation between them is given by $C = \frac{5}{9}(F - 32)$. Represent this information in the form of a graph taking F on x-axis and C on y-axis. Also, find temperature in Celsius which is equal to 30 degree Fahrenheit.

38. The height, curved surface area and volume of a cone are h, c and V respectively. Prove that $3\pi Vh^3 - c^2h^2 + 9V^2 = 0$

OR

A shot-put is a metallic sphere of radius 4.9 cm. If the density of the metal is 7.8 gm per cu cm, find the mass of the shot-put.

39. In Mathematics test given to 15 students, the following marks (out of 90) are recorded :

41, 39, 48, 52, 46, 62, 54, 40, 88, 52, 86, 40, 42, 52, 60

Find the mean, median and mode of this data.

40. Construct a triangle whose angles are in the ratio 1 : 3 : 5 and length of side included by first and last angles is 6 cm.