

PM SHRI KENDRIYA VIDYALAYA GACHIBOWLI, GPRA CAMPUS, HYD-32
SAMPLE PAPER TEST 02 FOR ANNUAL EXAM 2025

SUBJECT: MATHEMATICS
CLASS : IX

MAX. MARKS : 80
DURATION : 3 HRS

General Instruction:

1. This Question Paper has 5 Sections A-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.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

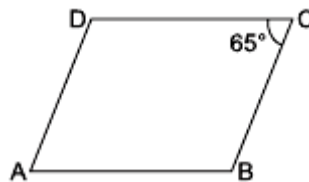
SECTION – A

Questions 1 to 20 carry 1 mark each.

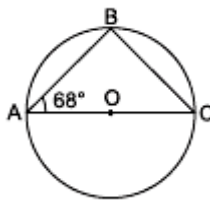
1. The value of $\frac{\sqrt{32} + \sqrt{48}}{\sqrt{8} + \sqrt{12}}$ is equal to
(a) $\sqrt{2}$ (b) 2 (c) 4 (d) 8
2. $\left(-\frac{1}{27}\right)^{-\frac{2}{3}}$ is equal to
(a) $8\left(\frac{1}{27}\right)^{-\frac{2}{3}}$ (b) 9 (c) $\frac{1}{9}$ (d) $27\sqrt{27}$
3. The value of $\sqrt{10}$ times $\sqrt{15}$ is equal to
(a) $5\sqrt{6}$ (b) $\sqrt{25}$ (c) $10\sqrt{5}$ (d) $\sqrt{5}$
4. The simplified form of $13^{\frac{1}{5}} \div 13^{\frac{1}{3}}$ is
(a) $13^{\frac{2}{15}}$ (b) $13^{\frac{8}{15}}$ (c) $13^{\frac{-1}{15}}$ (d) $13^{\frac{-2}{15}}$
5. Factors of $x^2 + 11x + 18$ are
(a) $(x + 9)(x - 2)$ (b) $(x - 9)(x - 2)$
(c) $(x - 9)(x + 2)$ (d) $(x + 9)(x + 2)$
6. If $(2x + 5)$ is a factor of $2x^2 - k$, then value of k is
(a) 2 (b) -1 (c) 25 (d) 25/2
7. The points (2, -1), (6, -5) and (-3, -2)
(a) lie in the I quadrant. (b) lie in the II quadrant.
(c) lie in the IV quadrant. (d) do not lie in the same quadrant.
8. Perpendicular distance of the point P(-3, 8) from y-axis is
(a) -3 (b) 8 (c) 3 (d) -8

9. If point (3, 0) lies on the graph of the equation $2x + 3y = k$, then the value of k is
 (a) 6 (b) 3 (c) 2 (d) 5
10. The graph of the linear equation $3x + 5y = 15$ cuts the x-axis at the point
 (a) (5, 0) (b) (3, 0) (c) (0, 5) (d) (0, 3)
11. Any solution of the linear equation $2x + 0y = 9$ in two variables, is of the form
 (a) $\left(\frac{9}{2}, 0\right)$ (b) $\left(\frac{9}{2}, n\right)$, n is a real number
 (c) $\left(n, \frac{9}{2}\right)$, n is a real number (d) $\left(0, \frac{9}{2}\right)$
12. Aditya was given a riddle by Pragya who stated that an angle is 24° less than its complementary angle. The angle's measure is:
 (a) 36° (b) 33° (c) 66° (d) 57°
13. If the ratio of two co-interior angles on the same side of the transversal is $7 : 8$, the bigger angle of the two angles is:
 (a) 54° (b) 100° (c) 96° (d) 84°
14. If $\triangle ACB \cong \triangle EDF$, then which of the following equations is/are true?
 (I) $AC = ED$
 (II) $\angle C = \angle F$
 (III) $AB = EF$
 (a) Only (I) (b) (I) and (III) (c) (II) and (III) (d) All of these

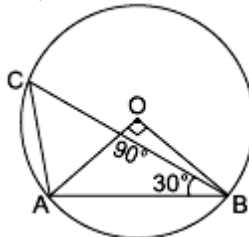
15. In the given figure, ABCD is a parallelogram. If $\angle C = 65^\circ$, then $(\angle B + \angle D)$ is equal to



- (a) 180° (b) 115° (c) 155° (d) 230°
16. In the given figure, O is centre of the circle, $\angle BAO = 68^\circ$, AC is diameter of the circle, then measure of $\angle BCO$ is



- (a) 22° (b) 33° (c) 44° (d) 68°
17. In figure, $\angle AOB = 90^\circ$ and $\angle ABC = 30^\circ$, then $\angle CAO$ is equal to



- (a) 30° (b) 45° (c) 90° (d) 60°
18. The length of each side of an equilateral triangle having an area of $9\sqrt{3} \text{ cm}^2$ is
 (a) 8 cm (b) 36 cm (c) 4 cm (d) 6 cm

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

Choose the correct option

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

19. Assertion (A): $2 + \sqrt{3}$ is an irrational number.

Reason (R): Sum of a rational number and an irrational numbers is always an irrational number.

20. Assertion (A): If the diagonal of a parallelogram are equal, then it is a rectangle.

Reason (R): The diagonals of parallelogram bisect each other at right angles.

SECTION – B

Questions 21 to 25 carry 2 marks each.

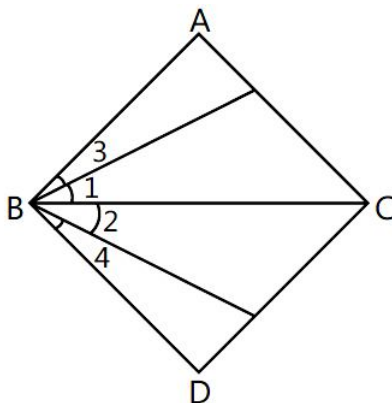
21. Express $0.12\bar{3}$ in the form p/q where p and q are integers where $q \neq 0$.

OR

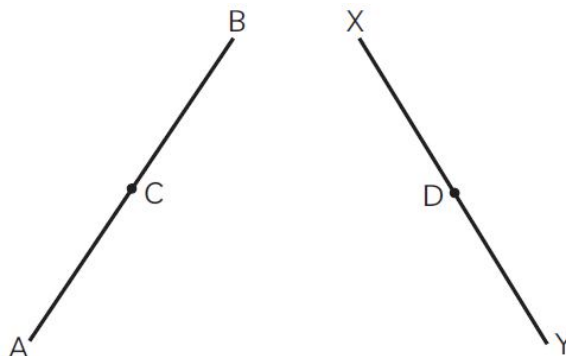
Find the value of x for which $\left(\frac{3}{4}\right)^6 \times \left(\frac{16}{9}\right)^5 = \left(\frac{4}{3}\right)^{x+2}$.

22. Find the distance of the following points from the y -axis: $P(3, 0)$, $Q(0, -3)$, $R(22, -5)$, $S(-3, -1)$.

23. In the given figure, we have $\angle 1 = \angle 2$, $\angle 3 = \angle 4$. Show that $\angle ABC = \angle DBC$. State the Euclid's axiom used.



24. In the figure, we have: $AC = XD$, C is the midpoint of AB and D is the mid-point of XY . Using an Euclid's axiom, show that $AB = XY$.



25. How many square metres of canvas is required for a conical tent whose height is 3.5 m and the radius of whose base is 12 m?

OR

The diameters of two cones are equal. If their slant heights are in the ratio 7:4, find the ratio of their curved surface area.

SECTION – C

Questions 26 to 31 carry 3 marks each.

26. Find the value of $\frac{4}{(216)^{\frac{2}{3}}} + \frac{1}{(256)^{\frac{3}{4}}} + \frac{2}{(243)^{\frac{1}{5}}}$

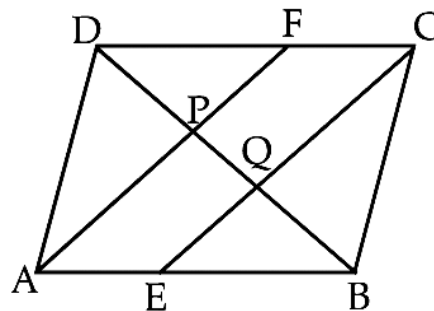
27. If $p(x) = x^2 - 4x + 3$, evaluate: $p(2) - p(-1) + p(\frac{1}{2})$.

28. For what value of p ; $x = 2, y = 3$ is a solution of $(p + 1)x - (2p + 3)y - 1 = 0$?

(i) Write the equation.

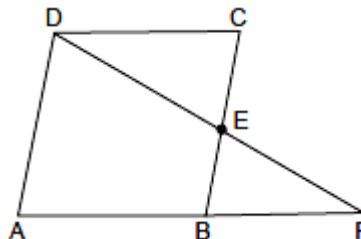
(ii) Is this line passes through the point $(-2, 3)$? Give justification.

29. In the figure, ABCD is a parallelogram. E and F are the mid-points of sides AB and CD respectively. Show that the line segments AF and EC trisect the diagonal BD.



OR

ABCD is a parallelogram and E is the mid-point of side BC. DE and AB on producing meet at F. Prove that $AF = 2AB$.



30. Draw a frequency polygon for the following distribution:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of marks	7	10	6	8	12	3	2	2

31. The length of 40 leaves of a plant are measured correct to one millimetre, and the obtained data is represented in the following table:

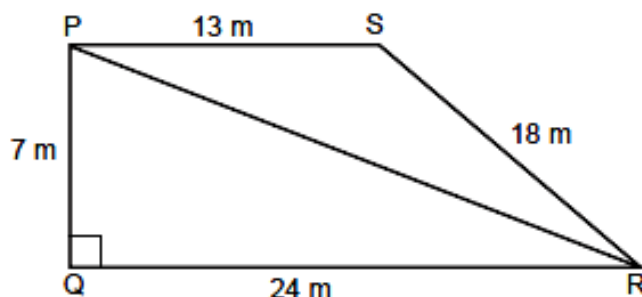
Length (in mm)	118-126	127-135	136-144	145-153	154-162	163-171	172-180
No. of leaves	7	10	6	8	12	3	2

Draw a histogram to represent the given data.

SECTION – D

Questions 32 to 35 carry 5 marks each.

32. The students of a school staged a rally for cleanliness campaign. They walked through the lanes in two groups. One group walked through the lanes PQ, QR and RP; while the other group walked through PR, RS and SP as shown in figure:



These two groups cleaned the area enclosed within their lanes. If $PQ = 7$ m, $QR = 24$ m, $RS = 18$ m, $SP = 13$ m and $\angle Q = 90^\circ$;

- (i) Which group cleaned more area and by how much?
- (ii) Find the total area cleaned by the students (neglecting the width of the lane).

OR

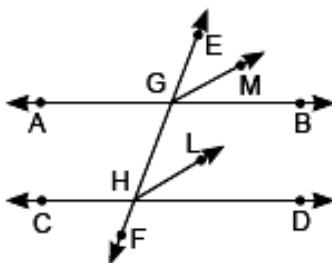
The perimeter of a triangle is 50 cm. One side of the triangle is 4 cm longer than the smallest side and the third side is 6 cm less than twice the smallest side. Find the area of the triangle.

33. Find the value of m and n so that the polynomial $f(x) = x^3 - 6x^2 + mx - n$ is exactly divisible by $(x - 1)$ as well as $(x - 2)$.

OR

Factorise the following: (i) $x^2 - \frac{y^2}{9}$ (ii) $2x^2 - 7x - 15$ (iii) $6x^2 + 5x - 6$

34. (a) The circumference of the base of 10 m high conical tent is 44 m. Calculate the length of canvas used in making the tent, if width of canvas is 2 m. (3)
 (b) Into a conical tent of radius 8.4 m and vertical height 3.5 m, how many full bags of wheat can be emptied, if space for the wheat in each bag is 1.96 m^3 ? (2)
35. In the given figure, EF is the transversal to two parallel lines AB and CD . GM and HL are the bisectors of the corresponding angles EGB and EHD . Prove that $GM \parallel HL$.



SECTION – E(Case Study Based Questions)

Questions 36 to 38 carry 4 marks each.

36. Case Study – 1:

On his birthday, Manoj planned that this time he celebrates his birthday in a small orphanage centre. He bought apples to give to children and adults working there. Manoj donated 2 apples to each children and 3 apples to each adult working there along with Birthday cake. He distributed 60 total apples.

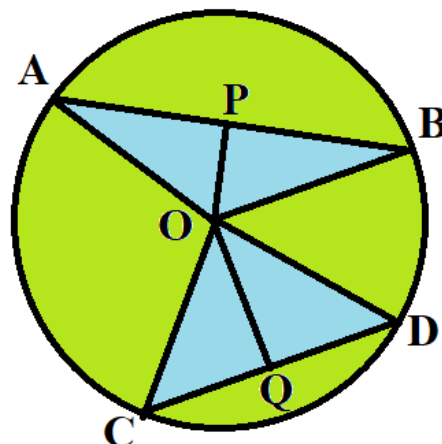
- (a) Taking the number of children as ' x ' and the number of adults as ' y '. Represent the above situation in linear equation in two variables.
- (b) If the number of children is 15, then find the number of adults.
- (c) If the number of adults is 12, then find the number of children.



(d) If $x = -5$ and $y = 2$ is a solution of the equation $3x + 5y = b$, then find the value of 'b'

37. Case Study – 2:

Aditya seen one circular park in which two triangular ponds are there whose common vertex is the centre of the park. After coming back to home, he tried to draw the circular park on the paper. He draws a circle of radius 10 cm with the help of a compass and scale. He also draws two chords, AB and CD in such a way that the perpendicular distance from the center to AB and CD are 6 cm and 8 cm respectively. Now, he has some doubts that are given below.



(i) Show that the perpendicular drawn from the Centre of a circle to a chord bisects the chord using any one triangle. (2)

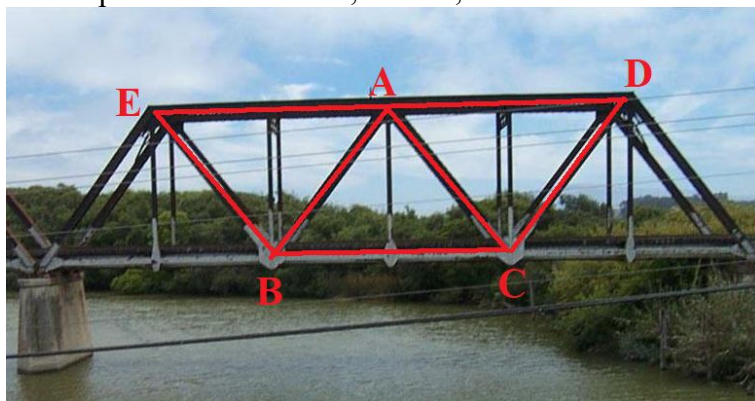
(ii) What is the length of CD? (2)

OR

(ii) What is the length of AB? (2)

38. Case Study – 3:

Truss bridges are formed with a structure of connected elements that form triangular structures to make up the bridge. Trusses are the triangles that connect to the top and bottom cord and two end posts. You can see that there are some triangular shapes are shown in the picture given alongside and these are represented as $\triangle ABC$, $\triangle CAD$, and $\triangle BEA$.



(a) If $AB = CD$ and $AD = CB$, then prove $\triangle ABC \cong \triangle CDA$

(b) If $AB = 7.5$ m, $AC = 4.5$ m and $BC = 5$ m. Find the perimeter of $\triangle ACD$, if $\triangle ABC \cong \triangle CDA$ by SSS congruence rule.

(c) If $\triangle ABC \cong \triangle FDE$, $AB = 5$ cm, $\angle B = 40^\circ$ and $\angle A = 80^\circ$. Then find the length of DF and $\angle E$.

