Sample Paper (Session 2017-18) - 4

Time: 3 Hr   Class: IX Subject: Mathematics   M.M:80

Instruction: The question paper consists of 30 questions divided into four section A, B, C, and D.

Section-A comprises of 6 questions of 1 mark each; Section-B comprises of 6 questions of 2 marks each;

Section-C comprises of 10 questions of 3 marks each and Section-D comprises of 8 questions of 4 marks each.
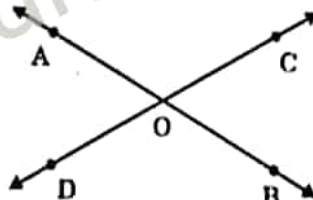
SECTION – A

Question numbers 1 to 6 carry one mark each.

1. Insert a rational number between 2.1 and 3.
2. Find the value of $f(x) = 3x^2 - 5x + 3$ at $x = -2$.
3. If the area of an equilateral triangle is $16\sqrt{3}$ cm^2, then find the perimeter of the triangle.
4. Find the range of two digits numbers.
5. Find the complement of $37°$.
6. In $\triangle ABC$ and $\triangle DEF$, AB = DE, BC = EF and AC = DF. Are the triangles congruent? If yes, by which congruence rule?

SECTION – B

Question numbers 7 to 12 carry two marks each.

7. Write abscissas of following points :
   $(4, 0)$, $(5, -3)$, $(-3, 4)$ and $(0, -4)$
8. Plot three points A$(4, 0)$, B$(0, -4)$ and C$(-4, 0)$ on the coordinate plane. Now, plot point D so that ABCD is a rhombus. Give coordinates of the point D.
9. Using remainder theorem, check whether the polynomial $2x^3 - 2ax^2 - 6x + 6a$ is a multiple of $x - a$.
10. In the figure, lines AB and CD intersect each other at point O. If $\angle AOC : \angle COB = 5 : 4$, then find all the angles.


11. Curved surface area and circumference at the base of a solid right circular cylinder are 2200 m^2 and 110 m respectively. Find its height and radius.
12. If the mode of the following data is 7, find the value of x :
   3, 5, 6, 7, 5, 4, 7, 5, 6, $x + 1$, 8, 7.

SECTION – C

Question numbers 13 to 22 carry three marks each.

13. Express 0.2353535...... in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.
14. In the given figure, AB ∥ CD, and DE ∥ FG, Determine $\angle PDE$, $\angle AFD$ and $\angle DFG$.
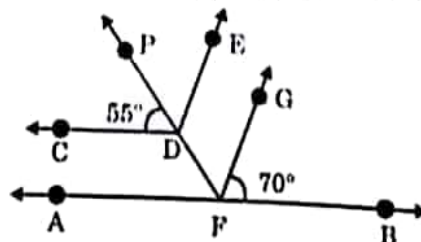
15. Prove that $9x^2 + 30x + 28$ has no zeroes.

16. Find two solutions of the equation $4x - 5y = 15$. Also, check whether $(2, -2)$ is a solution or not.

17. ABCD is a square. X and Y are points on the sides AD and BC such that AY = BX. Prove that $\angle XAY = \angle YBX$.

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

19. Two equal chords PQ and RS of a circle with centre O, when produced meet at a point M as shown in the figure. Prove that QM = SM.
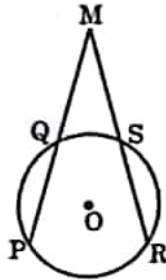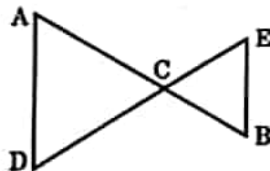

20. The sides of a quadrilateral ABCD are AB = 13 cm, BC = 16 cm, CD = 20 cm and DA = 5 cm. If BD = 12 cm, find the area of the quadrilateral, using Heron's formula.

21. The sum of the base radius and the height of a solid right circular cylinder is 37 cm. If the total surface area of the cylinder is 1628 cm², then find the volume of the cylinder.

22. The following observations have been arranged in ascending order :

    14, 19, 23, 38, 40, $x-2$, $x+2$, 62, 68, 74, 85, 93.

    If the median of this data is 53, find value of x and also find their mean.

SECTION – D

Question numbers 23 to 30 carry four marks each.

23. If $a = \dfrac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $b = \dfrac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, then find the value of $a^2 + b^2$.

24. The polynomials $x^3 + 2x^2 - 5ax - 8$ and $x^3 - ax^2 - 12x - 6$, when divided by $(x - 2)$ and $(x - 3)$ respectively, leave the remainders p and q. If $q - p = 10$, find a.

25. Find three integral solutions of $3x + 4y + 24 = 0$. Represent this equation by a graph. Does it pass through origin?

26. In the figure, we have AC = DC, CB = CE. Show that AB = DE. State which axiom you use here. Also give two more axioms other than the axiom used in the above situation.

27. AB and CD are respectively the smallest and the longest sides of a quadrilateral ABCD as shown in the figure given below. Prove that ∠A > ∠C and ∠B > ∠D.
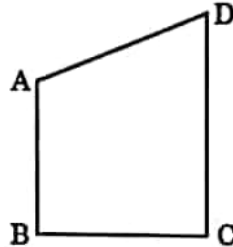
28. There is a triangular park ABC whose two corner angles A and B are 50° and 60° respectively. Three friends Rashmi, Sita and Geeta go daily on morning walk and walk along these three sides AB, BC and AC respectively. Who walks maximum distance among these three ? Who walks least ? Why morning walk is necessary for us ?

29. The sides of a triangle are in ratio 12 : 17 : 25. If perimeter of the triangle is 540 cm, find the area of a triangle.

30. The lengths of 70 leaves of a plant are measured in millimetres and the 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	9	12	15	18	7	5	4

Draw a histogram to represent the given data. Is it correct to conclude that maximum number of leaves are 153 mm long ? Why ?

ANSWERS

1. $2.1 < 2.55 < 3$
2. 25
3. 24 cm
4. 89
5. 53°
6. Yes, SSS
7. 4, 5, –3, 0
8. D = (0, 4)
9. Yes
10. ∠AOD = ∠COB = 80°, ∠BOD = ∠AOC = 100°
11. Height = 20 m, Radius = 17.5 m
12. $x = 6$
13. $\dfrac{233}{990}$
14. 55°, 55°, 55°
16. $x = 0, y - 3; x = 5, y = 1$; no
20. 126 cm^2
21. 4620 cm^3
22. $x = 53$, Mean = $51\dfrac{5}{6}$
23. 98
24. $a = 33$
25. (–4, –3), (0, –6), (–8, 0) no, it does not pass through origin.
28. Rashmi walks the maximum distance and Sita walks the least distance.
    Value : Morning walk is necessary for good health.
29. 9000 cm^2
30. No