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SAMPLE PAPER FOR HALF YEARLY EXAM (2019-20)

SUBJECT:MATHEMATICS **MAX. MARKS :80**
CLASS:IX **DURATION : 3 HRS**

(i). **All** questions are compulsory.
(ii). This question paper contains 4**0** questions divided into four Sections A, B, C andD.
(iii). **Section A** comprises of 20 questions of **1 mark** each. **Section B** comprises of 6 questions of **2 marks** each. **Section C** comprises of 8 questions of **3 marks** each and **Section D** comprises of 6 questions of **4 marks**each.
(iv). There is no overall choice. However, an internal choice has been provided in two questions of 2 marks each, two questions of 3 marks each and two questions of 4 marks each. You have to attempt only one of the alternatives in all suchquestions.
(v). Use of Calculators is notpermitted

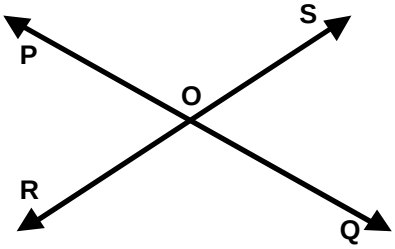
SECTION – A

Questions 1 to 20 carry 1 mark each.

1. Three angles of aquadrilateral are 75^0, 90^0 and 75^0. The fourth angle is ….
(a)90^0 (b)95^0 (c)105^0 (d)120^0

2. In a triangle ABC, if $\angle A + \angle B = 65^0$ and $\angle B + \angle C = 140^0$, then the measure of $\angle B$ is
(a)40^0 (b)25^0 (c)115^0 (d)60^0

3. Two lines PQ and RS intersect at O. If $\angle POR = 50^0$, then value of $\angle ROQ$ is
(a)120^0 (b)130^0 (c)90^0 (d)150^0



4. Two adjacent angles on a straight line are in the ratio 5 : 4. then the measure of each one of these angles are
(a) $100^0$and 80^0 (b) 75^0and105^0 (c) 90^0 and 90^0 (d) 60^0 and120^0

5. If (2, 0) 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. The value of $125^{-\frac{1}{3}}$ is …….
(a)$\frac{1}{5}$ (b)$\frac{1}{25}$ (c)$\frac{1}{15}$ (d)$\frac{1}{125}$

7. The zero of $p(x) = 9x + 4$is:
(a)$\frac{4}{9}$ (b)$-\frac{4}{9}$ (c)$\frac{9}{4}$ (d)$-\frac{9}{4}$

8. If $x + 2$is a factor of $x^3 + 2ax^2 + ax - 1$ then the value of $a$is
(a) $\frac{2}{3}$ (b) $\frac{3}{5}$ (c) $\frac{3}{2}$ (d) $\frac{1}{2}$

9. The coordinates of the point lying on the negative side of x-axis at a distance of 5 units from origin are …….
(a)(0,5) (b)(0,–5) (c)(–5,0) (d) (5,0)

10. The distance of the (4, –3) from x – axisis

(a) 3units (b)–3units (c)4 units (d) 5units

11. Rationalise the denominator of $\frac{1}{3-\sqrt{2}}$

(a) $3 + \sqrt{2}$ (b) $\frac{3+\sqrt{2}}{7}$ (c) $\frac{3-\sqrt{2}}{7}$ (d) $3 - \sqrt{2}$

12. The value of $(81)^{0.16}\ X\ (81)^{0.09}$

(a) 3 (b) 5 (c) 4 (d) 2

13. The value of k, if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$.

(a) 3 (b) 7 (c) 4 (d) 9

14. Express $2x = 5y$in the form $ax + by + c = 0$.

(a) $2x - 5y = 0$ (b) $2x + 5y = 0$ (c) $2x - 5y + 0 = 0$ (d)$2x + 5y + 0 = 0$

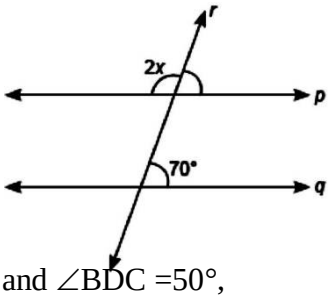
15. One of the angles of a triangle is 50º and the other two angles are equal. Find the measure of each of the equalangles.

(a) 75^0, 75^0 (b) 70^0, 70^0 (c) 65^0, 65^0 (d) 60^0, 60^0

16. If $x + 6$isa factor of $p(x) = x^3 + 3x^2 + 4x + k$, find the value of$k$.

(a) 24 (b) – 24 (c) 84 (d) – 84

17. In the given figure, p | | q. The value of x is …….



(a) 65 (b) 75 (c) 55 (d) 60

18. Without actually calculating the cubes, find the value of $(-12)^3 + (7)^3 + (5)^3$.

(a) 420 (b) – 420 (c) 320 (d) – 320

19. Diagonals AC and BD of parallelogram ABCD intersect at O. If ∠BOC = 90° and ∠BDC =50°, find ∠OAB.

20. Write the coordinates of the point lying on x-axis and with x-coordinate4.

SECTION – B

Questions 21 to 26 carry 2 marks each

21. Show that 1.2727… can be expressed in the form of $\frac{p}{q}$, where p and q are integers and $q \neq 0$.

22. Find the solution of the linear equation $x + 2y = 8$ which represents a point on (i) x-axis (ii) y- axis

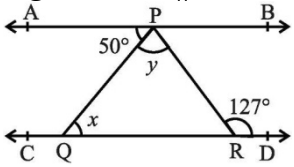
OR

Find the value of a and b, if the line $6bx + ay = 24$ passes through (2, 0) and (0, 2).

23. The angles of quadrilateral are in the ratio 3 : 5 : 9 : 13. Find all the angles of the quadrilateral.

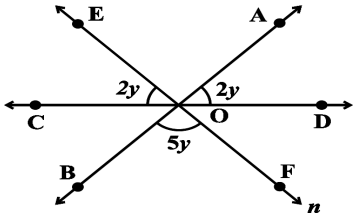
24. ΔABC is right angled in which ∠A = 90° and AB = AC. Find ∠ B and ∠ C.

25. In the below figure, if AB || CD, ∠APQ = 50° and ∠PRD = 127°, find x and y.



OR

In the below figure, AB, CD and EF are three lines concurrent at O. Find the value of y.



26. If $x - 2$ is a factor of $x^3 - 3x + 5a$ then find the value of a.

SECTION – C

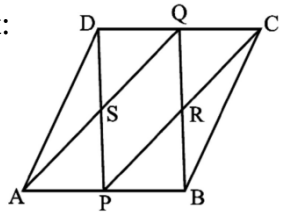
Questions 27 to 34 carry 3 marks each

27. ABCD is a parallelogram in which P and Q are midpoints of opposite sides of AB and CD. (see figure). If AQ intersects DP at S and BQ intersects at R, show that:

(i) APCQ is a parallelogram

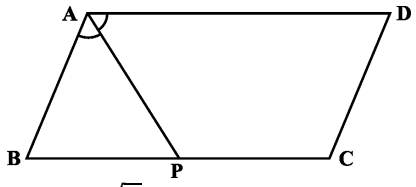
(ii) DPBQ is a parallelogram

(iii) PSQR is a parallelogram



OR

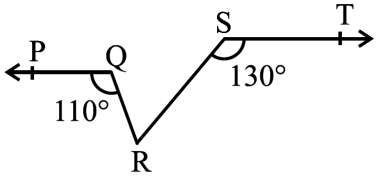
In the below figure, P is the mid-point of side BC of a parallelogram ABCD such that ∠ BAP = ∠ DAP. Prove that AD = 2CD.



28. Find the value of a and b in $\frac{3+\sqrt{7}}{3-\sqrt{7}} = a + b\sqrt{7}$

29. Factorise: $x^3 - 23x^2 + 142x - 120$

30. In the fig, if PQ || ST, ∠PQR = 110^0 and ∠RST = 130^0 then find the value of ∠QRS.



31. Solve the equation $2x + 11 = 0$, and represent the solution(s) on

(i) the number line (ii) the Cartesian plane

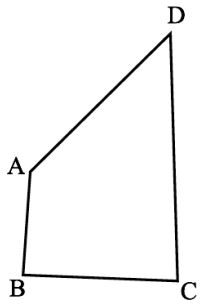
OR

Find the value of a, if the line 3y = ax + 7, will pass through: (i) (3, 4), (ii) (1, 2), (iii) (2, –3)

32. Draw the graphs of the equations $3x - 2y = 4$. Find the coordinates of the point where the line intersects the x-axis and y-axis.

33. In which quadrant or on which axis do each of the points (– 2, 4), (3, – 1), (– 1, 0), (1, 2) and (– 3, – 5) lie?

34. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see the adjoining figure). Show that ∠ A > ∠C and ∠ B > ∠ D.



SECTION – D

Questions 35 to 40 carry 4 marks each.

35. Simplify $\frac{4+\sqrt{5}}{4-\sqrt{5}} + \frac{4-\sqrt{5}}{4+\sqrt{5}}$ by rationalizing the denominator.

36. Prove that the exterior angle of any triangle is equal to the sum of its interior opposite angles.

37. P, Q, R and S are respectively the mid-points of the sides AB, BC, CD and DA of a quadrilateral ABCD such that AC ⊥ BD. Prove that PQRS is a rectangle.

38. The polynomial $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ when divided by $(x - 1)$ and $(x + 1)$ leaves remainder 5 and 9 respectively. Find the values of a and b.

OR

Factorise each of the following: (i) $27y^3 + 125z^3$ (ii) $64m^3 - 343n^3$

39. Points A (5, 3), B (– 2, 3) and D (5, – 4) are three vertices of a square ABCD. Plot these points on a graph paper and hence find the coordinates of the vertex C.

40. In the below figure, *m* and *n* are two plane mirrors perpendicular to each other. Show that incident ray CA is parallel to reflected ray BD.