INDIAN SCHOOL SOHAR
PERIODIC TEST II (2019-20)
MATHEMATICS

Class: IX **Maxi. Marks: 80**
Date: 29/09/2019 **Duration: 3 Hours**

General Instructions:

a. All questions are compulsory.

b. The question paper consists of 40 questions divided into four sections A, B, C and D.

c. Section A contains 20 questions of 1 mark each, Section B contains 6 questions of 2 marks each, Section C contains 8 questions of 3 marks each, Section D contains 6 questions of 4 marks each.

*d There is no overall choice. However, an internal choice has been provided in **two** questions of 1 mark each, **two** questions of 2 marks each, **three** questions of 3 marks each and **two** questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.*

e Use of calculator is not permitted.

SECTION A

Question numbers 1 to 10 carry 1 mark each. For each questions, four alternative choices have been provided of which only one is correct. You have to select the correct choice.

1. The coefficient of x^2 in $(3x + x^3)(x + \frac{1}{x})$ is :

   a) 3 b) 4 c) 1 d) 2

2. Each equal side of an isosceles right triangle is x cm. Its area is :

   a) $2x$ cm^2 b) x^2 cm^2 c) $2x^2$ cm^2 d) $\frac{1}{2}x^2$ cm^2

3. The value of n for which $\sqrt{n}$ be a rational number is :

   a) 4 b) 3 c) 5 d) 8

4. Degree of zero polynomial is :

   a) 0 b) 1 c) not defined d) any natural number

5. Identify an irrational number among the following decimal expansions:

   a) 0.343343334 b) 0.343434……. c) $3.\overline{4}$ d) 0.343443444…….

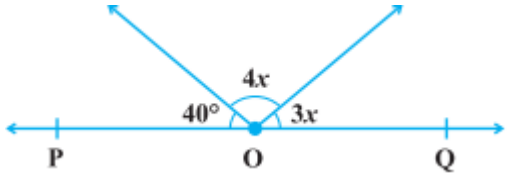
6. If ordinate of a point is zero, then this point always lies :

   a) on x-axis b) in I quadrant c) in II quadrant d) on y-axis

7. The sum of the bisectors of the angles of a linear pair is always :

   a) Less than 90° b) greater than 90° c) equal to 90° d) equal to 180°

8. In the figure, value of x is :



   a) 20° b) 30° c) 25° d) 35°

9. If one angle of a triangle is equal to the sum of the other two angles, then the triangle is :

a) an isosceles triangle b) an obtuse angled triangle

c) an equilateral triangle d) a right triangle

10. It is not possible to construct a triangle when its sides are :

a) 8.3 cm, 3.4 cm, 6.1 cm b) 5.4 cm, 2.3 cm, 3.1 cm

c) 6 cm, 7 cm, 10 cm, d) 3 cm, 5 cm, 5 cm

Question numbers 11 to 20 carry 1 mark each.

11. Find a rational number between $\sqrt{3}$ and $\sqrt{7}$

12. Find the value of $\sqrt[4]{(64)^{-2}}$

13. If the abscissa of a point is x and ordinate is y, then what are the coordinates of the point ?

14. If two sides of a triangle are 8 cm and 11 cm and the semi perimeter is 16 cm. Find third side of triangle.

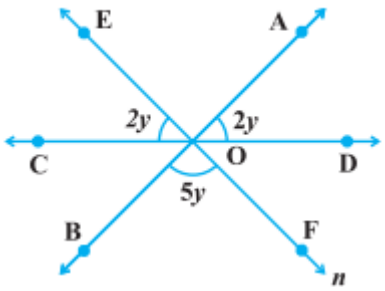
OR

Find the area of an equilateral triangle with side 10 cm.

15. How many terms are there in the polynomial $x^{140} + x^{139} + x^{138} + \ldots\ldots\ldots + x^2 + x + 1$?

16. One-third of an angle is equal to its supplement. Find the measure of this angle.

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



18. If A, B, C are three angles of a triangle. If $A - B = 25°$ and $B - C = 10°$, then find $\angle B$.

19. If $x + 1$ is a factor of the polynomial $2x^2 + kx$, then find the value of k.

OR

Find the value of polynomial $p(x) = 2x^2 + 7x + 3$ at $x = -2$

20. Find the remainder when the polynomial p(x) is divided by (b – ax).

SECTION B

Question numbers 21 to 26 carry 2 marks each.

21. Examine whether $3x - 2$ is a factor of the polynomial $3x^3 + x^2 - 20x + 12$.

22. Find the distances of following points from the x-axis :

    $(2, 3), (-3, 2), (2, -3)$ and $(-3, -2)$

23. Two lines AB and CD intersect each other at the point O such that BC || DA and BC = DA.

    Show that O is the mid-point of both the line-segments AB and CD.

OR

In ΔABC, $\angle B = 45°$, $\angle C = 55°$ and bisector of $\angle A$ meets BC at a point D. Find $\angle ADB$.

24. Factorise: $(p - q)^3 + (q - r)^3 + (r - p)^3$

OR

Factorise : $x^2 - 1 - 2a - a^2$

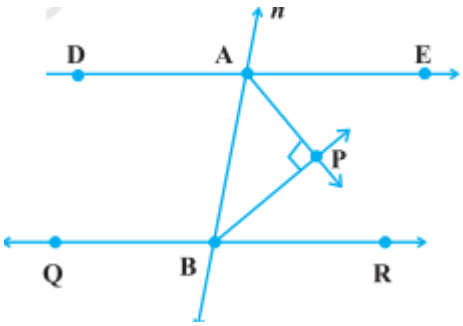
25. An isosceles triangle has perimeter 30 cm and each of the equal sides is 12 cm. Find area of the triangle.

26. If the side of a rhombus is 10 cm and one diagonal is 16 cm, then find the area of the rhombus.

SECTION C

Question numbers 27 to 35 carry 3 marks each.

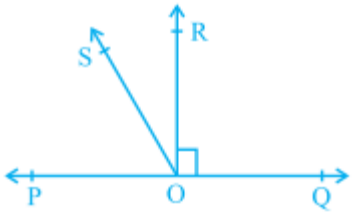
27. In the figure, DE||QR and AP and BP are bisectors of $\angle EAB$ and $\angle RBA$ respectively. Prove that $\angle APB = 90°$



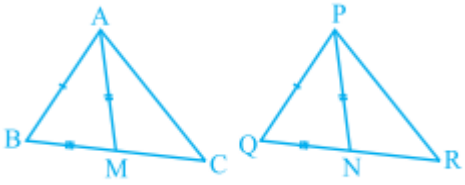
28. A field in the form of parallelogram has sides 60 m and 40 m and one of its diagonals is 80 m long. Find the area of parallelogram.

29. Simplify: $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt[5]{32} + \sqrt{225}$

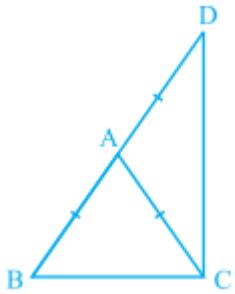
30. In the figure, POQ is a line, ray OR is perpendicular to the line PQ. OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.



31. In the figure two sides AB and BC and median AM of Δ ABC are respectively equal to sides PQ and QR and median PN of ΔPQR. Prove that Δ ABC $\cong \Delta PQR$

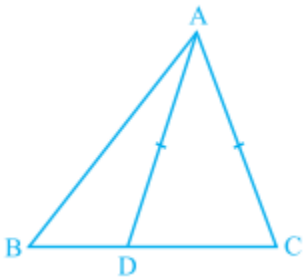


32. In the figure, Δ ABC is an isosceles triangle in which AB = AC, side BA is produced to D such that AD = AB. Show that ∠BCD is a right angle.



OR

In the figure D is a point on side BC of ΔABC such that AD = AC. Show that AB > AD.



33. If $a^{\frac{1}{3}} + b^{\frac{1}{3}} + c^{\frac{1}{3}} = 0$. Then prove that $(a + b + c)^3 = 27abc$.

OR

If $a^3 + b^3 + c^3 = 3abc$ and $a + b + c = 0$, prove that $\frac{(b+c)^2}{3bc} + \frac{(c+a)^2}{3ac} + \frac{(a+b)^2}{3ab} = 1$

34. Find the square root of 7.5 geometrically.

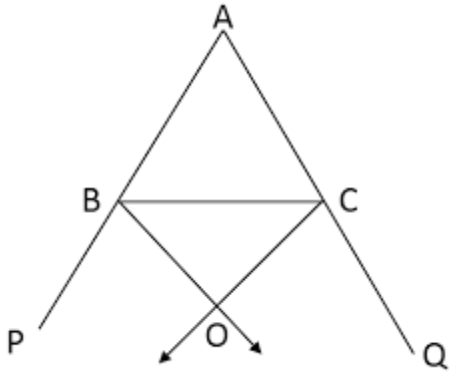
OR

If $a = 9 + 4\sqrt{5}$, find the value of $\sqrt{a} - \frac{1}{\sqrt{a}}$

SECTION D

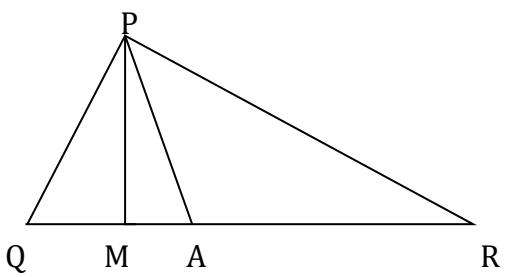
Question numbers 35 to 40 carry 4 marks each.

35. In figure, the sides AB and AC of ΔABC are produced to points P and Q respectively. If the bisectors BO and CO of $\angle CBP$ and $\angle BCQ$ respectively meet at point O, then prove that $\angle BOC = 90° - \frac{1}{2}\angle BAC$.



OR

In the given figure, $\angle Q > \angle R$, PA is the bisector of $\angle QPR$ and $PM \perp QR$. Prove that $\angle APM = \frac{1}{2}(\angle Q - \angle R)$



36. Find the value of a and b if $\frac{4+\sqrt{3}}{4-\sqrt{3}} - \frac{4-\sqrt{3}}{4+\sqrt{3}} = a + \sqrt{3}\, b$

37. If $a + b + c = 5$ and $ab + bc + ca = 10$, then prove that $a^3 + b^3 + c^3 - 3abc = -25$

38. Three vertices of a rectangle ABCD are A(1, 3), B(1, − 1), C(−1, −1). Plot these points on a graph paper and hence use it to find the co-ordinates of the 4th vertex D. Also find the area of the rectangle.

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

OR

Using factor theorem show that $x^2 + 5x + 6$ is factor of $x^4 + 5x^3 + 9x^2 + 15x + 18$

40. Prove that two triangles are congruent if any two angles and the included side of one triangle is equal to any two angles and the included side of the other triangle.

***** end *****