



**INDIAN SCHOOL MUSCAT  
HALF YEARLY EXAMINATION  
MATHEMATICS**

CLASS: IX

Sub. Code: 041

Time Allotted: 3 Hrs

23.09.2019

Max. Marks: 80

**General Instructions:**

1. All questions are **compulsory**.
2. The question paper consists of **40** questions divided into **four sections A, B, C and D**. **Section-A** comprises **20** questions of **1 mark** each; **Section-B** comprises **6** questions of **2 marks** each; **Section-C** comprises **8** questions of **3 marks** each and **Section-D** comprises **6** questions of **4 marks** each.
3. There is no overall choice. However, an internal choice has been provided in 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 questions in all such questions.
4. Use of calculator is not permitted.

**SECTION – A (20 × 1 = 20)****I Multiple Choice Questions.**

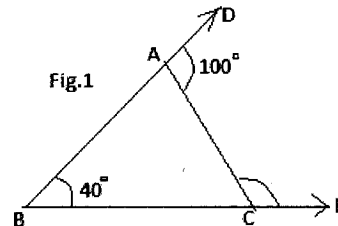
**Choose the correct answer and write the answer with the option given.**

1. An irrational number between 0.3101 and 0.333.... is  
 (a) 0.32010010001....      (b) 0.1010010001...      (c) 0.3201      (d) 1.323232.....
2. Which of the following expressions is a polynomial in one variable?  
 (a)  $\sqrt{y} - 3$       (b)  $\frac{1}{x} + x + 2$       (c)  $\sqrt{2}x^2 - 3x + 6$       (d)  $x^2 + 6y + 10$
3. Abscissa of a point is positive in  
 (a) quadrant I only      (b) quadrant II only      (c) quadrants I and II      (d) quadrants I and IV
4. The coefficient of the highest power of x in the polynomial  $2x^3 - 4x^4 + 5x^2 - x^5 + 3$  is  
 (a) 2      (b) -4      (c) 1      (d) -1
5. The value of  $x^{a-b} \times x^{b-c} \times x^{c-a}$  is  
 (a) 0      (b) 1      (c) 2      (d) x
6. The graph of  $x = -1$  is parallel to :  
 (a) x-axis      (b) y-axis      (c)  $x = y$       (d) neither x-axis nor y-axis
7. Which of the points A (0, 6), B (-2, 0), C (0, -5), D (3, 0) and E (1, 2) lie on y-axis?  
 (a) A and C      (b) B and D      (c) A, C and E      (d) E only

8. 50% of an angle is the supplement of  $120^\circ$ . The measure of the angle is :  
 (a)  $60^\circ$  (b)  $100^\circ$  (c)  $120^\circ$  (d)  $30^\circ$
9. In  $\triangle ABC$  and  $\triangle PQR$ , if  $AB=QR$ ,  $BC=PR$  and  $CA=PQ$ , then  
 (a)  $\triangle ABC \cong \triangle PQR$  (b)  $\triangle CBA \cong \triangle PRQ$  (c)  $\triangle BAC \cong \triangle RPQ$  (d)  $\triangle PQR \cong \triangle BCA$
10. An exterior angle of a triangle is  $95^\circ$  and one of its interior opposite angles is  $48^\circ$ , then the other interior opposite angle is  
 (a)  $42^\circ$  (b)  $53^\circ$  (c)  $47^\circ$  (d)  $57^\circ$

**II Answer the following questions:**

11. Given that  $\sqrt{10} = 3.162$ , find the value of  $\frac{1}{\sqrt{10}}$
12. In  $\triangle ABC$ ,  $\angle A = 70^\circ$  and  $AB = AC$ , then find  $\angle B$ .
13. Simplify:  $(125)^{\frac{-1}{3}}$
14. A wheel has six spokes equally spaced. What is the angle between two adjacent spokes?
15. Find the mirror image of the point  $(-4, 5)$  with respect to x-axis.
16. If  $(2, -3)$  is a solution of the equation  $2y = ax + 4$ , then find the value of  $a$ .
17. In fig.1, calculate  $\angle ACE$



18. Evaluate using suitable identity:  $104 \times 96$
19. In  $\triangle PQR$ ,  $\angle P = 100^\circ$  and  $\angle R = 50^\circ$ . Which side of the triangle is the shortest? Give reason(s) for your answer.
20. If  $x = 2$  is a zero of polynomial  $2x^2 + 3x - p$ , then find the value of  $p$ .

**SECTION – B ( 6 × 2= 12)**

21. Express  $0.5\bar{7}$  as a rational number.
22. Expand using suitable identity:  $(3a - 2b + 5c)^2$

**(OR)**

If  $x + y + z = 9$  and  $xy + yz + zx = 23$  then find the value of  $(x^2 + y^2 + z^2)$ .

23. Find the coordinates of the point which lies on (i) x and y axes both.  
 (ii) x-axis at a distance of 8 units from the y-axis to its right.
24. Frame a linear equation in the form  $ax + by + c = 0$  by using the given values of a, b and c.  
 (i)  $a = -2, b = 3, c = 4$       (ii)  $a = 5, b = 0, c = 7$
25. If two interior angles on the same side of a transversal intersecting two parallel lines are in the ratio 2 : 3, then find the smaller of the two angles.

(OR)

The angles of a triangle are  $(x+10)^\circ, (x+40)^\circ$  and  $(2x - 30)^\circ$ . Find the value of x and mention the type of triangle according to sides.

26. Show that in a right angled triangle, the hypotenuse is the longest side.

**SECTION – C (8 x 3= 24)**

27. Represent  $\sqrt{5}$  on the number line.  
 (OR)

Represent  $\sqrt{5.3}$  on the number line.

28. Classify the following numbers as rational or irrational:

a)  $-\sqrt{0.4}$     b)  $\frac{\sqrt{12}}{\sqrt{3}}$     c)  $(1 + 2\sqrt{5}) - (4 + \sqrt{5})$     d)  $\frac{3}{11}$     e)  $(\sqrt{5} - 3)^2$     f) 0.7356

29. If the polynomials  $a^3 + 4x^2 + 3x - 4$  and  $x^3 - 4x + a$  leave the same remainder when divided by  $x - 3$ , find the value of a.

(OR)

If a, b, c are all non-zero and  $a + b + c = 0$ , then find the value of  $\frac{a^2}{bc} + \frac{b^2}{ac} + \frac{c^2}{ab}$

30. Two line segments AB and CD intersect each other at O such that  $AO = OB$  and  $CO = OD$ .

Prove that  $AC = BD$ .

(OR)

In fig.2,  $\angle CAB : \angle BAD = 1 : 2$ , find all the interior angles of  $\triangle ABC$

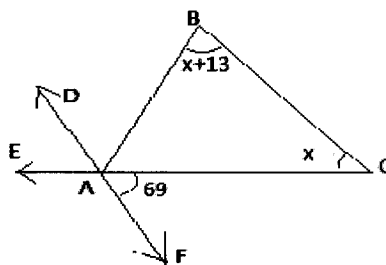


fig.2

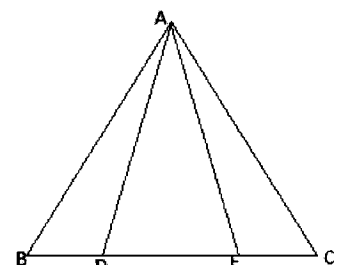


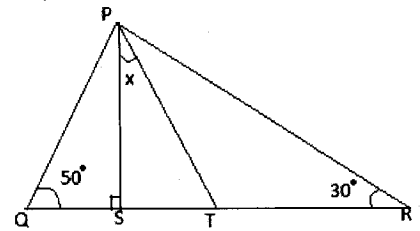
Fig.3

31. In fig3, an isosceles triangle ABC with  $AB=AC$ , D and E are points on BC such that  $BE=CD$ . Show that  $AD=AE$ .
32. Prove that angles opposite to equal sides of an isosceles triangle are equal.
33. One number is three times the other number. Write a linear equation in two variables to represent this statement. Also find three solutions of the equation.
34. Factorize: (i)  $27p^3 - \frac{1}{216} - \frac{9}{2}p^2 + \frac{1}{4}p$  (ii)  $8x^3 + 343y^3$

**SECTION – D ( $6 \times 4 = 24$ )**

35. If  $a + b\sqrt{3} = \frac{\sqrt{3}-1}{\sqrt{3}+1} - \frac{\sqrt{3}+1}{\sqrt{3}-1}$ , find the values of a and b.
36. Plot the points A (-3, 0), B (3, 0), C (2, 3) and D (-2, 3) on a graph. Join these points in the given order. Name the figure so obtained and also find its area
37. Draw the graph of the equation  $2x - 3y + 1 = 0$ . Check from the graph whether the point (3, -2) lies on the graph or not.
38. The sides AB and AC of  $\triangle ABC$  are produced to points E and D respectively. If bisectors BO and CO of  $\angle CBE$  and  $\angle BCD$  respectively meet at point O, then prove that  $\angle BOC = 90^\circ - \frac{1}{2} \angle BAC$ .

Fig.4



In fig.4, PT is the bisector of  $\angle QPR$  in  $\triangle PQR$  and  $PS \perp QR$ . Find the value of x. (Show the working)

39. In right triangle ABC, right angled at C, M is the mid-point of hypotenuse AB. C is joined to M and produced to a point D such that  $DM=CM$ . Point D is joined to point B. Show that (i)  $\triangle AMC \cong \triangle BMD$   
(ii)  $\angle DBC = 90^\circ$

**(OR)**

$\triangle ABC$  and  $\triangle DBC$  are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC. If AD is extended to intersect BC at P, show that (i)  $\triangle ABD \cong \triangle ACD$   
(ii)  $\triangle ABP \cong \triangle ACP$ .

40. Factorize:  $2x^3 + 3x^2 - 9x - 10$

**End of the Question Paper**