



# 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 ( $20 \times 1 = 20$ )****I Multiple Choice Questions.**

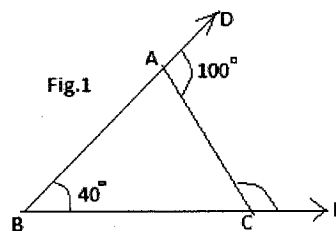
**Choose the correct answer and write the answer with the option given.**

1. A rational number between 0.3101 and 0.333.... is  
 (a) 0.32010010001.... (b) 0.1010010001... (c) 0.3201 (d) 1.323232....
2. 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
3. Ordinate 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. 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)  $\triangle PQR \cong \triangle BCA$
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. The value of  $x^{a-b} \times x^{b-c} \times x^{c-a}$  is  
 (a) 0 (b) 1 (c) 2 (d) x
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. 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)  $x^2 + 6y + 10$
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. If  $x - 2$  is a factor of polynomial  $2x^2 + 3x - p$ , then find the value of  $p$ .
12. In  $\triangle ABC$ ,  $\angle A = 80^\circ$  and  $AB = AC$ , then find  $\angle B$ .
13. Simplify:  $(625)^{-\frac{1}{4}}$
14. In  $\triangle PQR$ ,  $\angle P = 90^\circ$  and  $\angle R = 50^\circ$ . Which side of the triangle is the shortest? Give reason(s) for your answer.
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:  $102 \times 98$
19. Given that  $\sqrt{10} = 3.162$ , find the value of  $\frac{1}{\sqrt{10}}$
20. A wheel has six spokes equally spaced. What is the angle between two adjacent spokes?

**SECTION – B ( 6 × 2= 12)**

21. 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.
22. Expand using suitable identity:  $(2x - \frac{1}{2}y - 3z)^2$

**(OR)**

- If  $x + y + z = 9$  and  $xy + yz + zx = 23$  then find the value of  $(x^2 + y^2 + z^2)$ .
23. Express  $1.4\bar{7}$  as a rational number.

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  $4 : 5$ , 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. In  $\Delta PSR$ ,  $Q$  is a point on  $SR$  such that  $PQ = PR$ , show that  $PS > PQ$ .

### SECTION – C (8 x 3= 24)

27. Prove that angles opposite to equal sides of an isosceles triangle are equal.
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. Cost of four cakes and three cookies together is Rs.150. Write a linear equation in two variables to represent this statement. Also find three solutions of the equation.
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  $\Delta ABC$

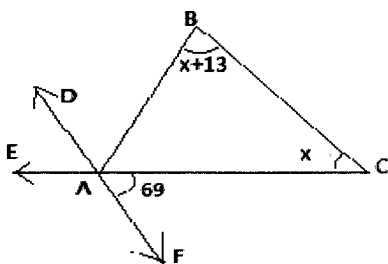


fig.2

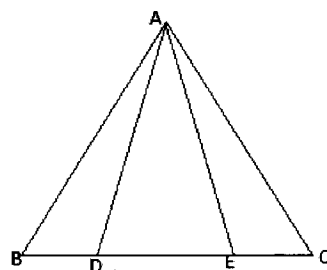


Fig.3

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

(OR)

If  $a+b+c=5$  and  $ab + bc + ca = 10$  then find the value of  $a^3 + b^3 + c^3 - 3abc$

33. Represent  $\sqrt{3}$  on the number line.

(OR)

Represent  $\sqrt{4.8}$  on the number line.

34. Factorize: (i)  $\frac{64}{27} z^3 - 1 - \frac{16}{3} z^2 + 4z$  (ii)  $8x^3 + 125y^3$

### SECTION - D ( $6 \times 4 = 24$ )

35. 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)  $\triangle ABP \cong \triangle ACP$ .

36. Factorize:  $6x^3 - 7x^2 - 8x + 5$

37. Draw the graph of the equation  $2x + 3y = 12$ . 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  $\angle BOC = 90^\circ - \frac{1}{2} \angle BAC$ .

(OR)

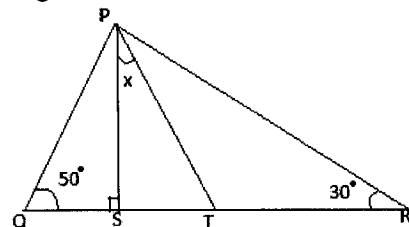
In fig.4, PT is the bisector of  $\angle QPR$  in  $\triangle PQR$  and  $PS \perp QR$ .

Find the value of x. (Show the working)

39. 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.

40. 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.

Fig.4



**End of the Question Paper**