MDH INTERNATIONAL SCHOOL DWARKA

MID TERM EXAMINATION- (2025-26)

SUBJECT: MATHEMATICS

CLASS-IX

TIME:3 Hrs. **M.M:80**

General Instructions:

.This Question Paper has 5 Sections A-E.

. Section A has 18 MCQs and 2 Assertion Reason based questions carrying 01 mark each.

.Section B has 5 questions carrying 02 marks each.

. Section C has 6 questions carrying 03 marks each.

. Section D has 3 case study-based questions carrying 04 marks each.

.Section E has 4 questions carrying 05 marks each.

.All questions are compulsory.

. Draw neat figures wherever required.

. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION – A (1 MARK EACH)

Choose the correct answer from the options given:

1. Which of the following is a polynomial?
   (a) $x^2 + \frac{1}{x}$ (b) $3x + 7$ (c) $\sqrt{x} + 1$ (d) $\frac{1}{x} + 2$
2. The degree of the polynomial is: $7x^3 + 4x^2 + 9$
   (a) 1 (b) 2 (c) 3 (d) 4
3. The coordinates of a point on the x-axis are of the form:
   (a) (a, 0) (b) (0, b) (c) (a, b) (d) (0, 0)
4. The solution of the equation $2x - 4 = 7x+1$ is:
   (a) 1 (b) 0 (c) -1 (d) -2
5. Distance of point (3, -5) from x- axis
   (a) 3 units (b) 5units (c) $\sqrt{34}$ units (d) 0 units
6. The value of $(-2)^0$ is:
   (a) -2 (b) -32 (c) 1 (d) 0
7. In two triangles, ABC and PQR, $\angle A = 30°$, $\angle B = 70°$, $\angle P = 70°$, $\angle Q = 80°$ and AB = RP, then
   (a) $\Delta ABC \cong \Delta PQR$ (b) $\Delta ABC \cong \Delta QRP$
   (c) $\Delta ABC \cong \Delta RPQ$ (d) $\Delta ABC \cong \Delta RQP$

8. Zero of the polynomial $p(x) = cx + d$ is:

(a) -d (b) -c (c) $\frac{-d}{c}$ (d) $\frac{d}{c}$

9. Which of the following is an irrational number?

(a) 0.25 (b) $\sqrt{3}$ (c) 0.333... (d) $\frac{7}{8}$

10. Every rational number is

a) a natural number b) an integer c) a real number d) a whole number

11. In triangles ABC and DEF, if $\angle B = \angle E = 90°$, AB = DE, and BC = EF, then the triangles are congruent by:

(a) SSS (b) ASA (c) SAS (d) RHS

12. Which of the following can be expressed in the form $ax + by + c = 0$ as $3x + 2y + 5 = 0$?

(a) $3x - 2y = -5$ (b) $3x = 5 + 2y$

(c) $2y + 5 = -3x$ (d) $3x + 5 = 2y$

13. According to Euclid's second postulate, a terminated line can be extended:

(a) Only to the left (b) only to the right

(c) In both directions indefinitely (d) only to a specific length

14. Distance of a point $(-3,4)$ from origin is ___

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

15. A point has _____ dimension.

(a) One (b) Two (c) Three (d) Zero

16. Euclid stated that things which are equal to the same thing are equal to one another as:

(a) An axiom (b) a definition (c) a postulate (d) a theorem

17. Two parallel lines intersect at:

(a) One point (b)Two points (c) Three points (d) zero point

18. Two angles whose sum is equal to 180° are called:

(a) Vertically opposite angles (b) Complementary angles

(c) Adjacent angles (d) Supplementary angles

19. Assertion: If a transversal intersects two parallel lines, the sum of the interior angles on the same side of the transversal is 180 degrees.

Reason: If a transversal intersects two parallel lines, the alternate interior angles are equal.

(a) Both A and R are true, and R is the correct explanation of A

(b) Both A and R are true, but R is not the correct explanation of A

(c) A is true, R is false
(d) A is false, R is true

20. Assertion : Angles opposite to equal sides of a triangle are not equal.
Reason : Sides opposite to equal angles of a triangle are equal.

(a) Both A and R are true, and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, R is false
(d) A is false, R is true

SECTION-B (2 MARKS EACH)

21. If $x = 2 - \sqrt{3}$, find the value of $(x - \frac{1}{x})$.

22. Write the degree of (i) non zero constant polynomial (ii) zero polynomial

23. In the given figure, if AC = BD, then prove that AB = CD.

24. Write the answer to each of the following questions.

(i) What is the name of the horizontal and vertical lines drawn to determine the position of any point in the Cartesian plane?

(ii) Write the name of the point where these two lines intersect.

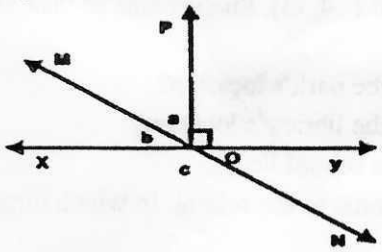
25. The cost of a notebook is twice the cost of a pen. Write a linear equation in two variables to represent this statement. Also find the cost of pen if cost of note book is Rs 35.

SECTION-C (3 MARKS EACH)

26. Find three different irrational numbers between the rational numbers $\frac{5}{7}$ & $\frac{9}{11}$.

27. Find the remainders when x^3-3x^2-3x+1 is divided by $2x+1$ and $3x-5$ respectively.

28. In the adjoining fig. lines XY and MN intersect at O. If $\angle POY = 90°$ and a : b = 2 : 3,

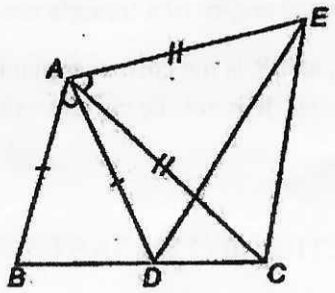


find a, b and c.

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

30. Write three solutions for the adjoining equation: $2x+y = 7$, represent on graph also.

31. In the adjoining fig, AC = AE, AB = AD and ∠BAD = ∠EAC. Show that BC = DE.



SECTION-D (4 MARKS EACH) CASE STUDY

32. A municipality is designing a triangular park △ABC. The side lengths and angles need to satisfy certain conditions for proper fencing and layout.
The survey team measures two sides: AB = 7m and AC = 7m.
angle at A is measured as 40 degrees
A walking path will be built from A to D on BC such that AD is perpendicular to BC.
The engineers also want to verify whether the park design is isosceles and if certain triangles inside it are congruent.

i) Which property of triangles can be used to prove that △ABC is isosceles?
a) Pythagoras Theorem b) ASA Congruence Rule
c) SAS Congruence Rule d) Properties of Isosceles Triangle

ii) In △ABC, what is ∠B if ∠A=40°?
a) 70 degrees b) 60 degrees
c) 40 degrees d) 50 degrees

iii) The perpendicular AD divides △ABC into two smaller triangles. Which congruence criterion will prove ABD≅△ACD?
a) ASA b) RHS c) SAS d) SSS

iv) If BC = 8m, what is the length of BD in metres?
a) 8 b) 4 c) 6 d) 3

33. Sneha is creating a map of her neighborhood using a Cartesian plane. She decides to use the origin (0, 0) as her home. She places the school at the coordinates (2, 5), the park at (-3, 4), and the library at (- 4, -3). Sneha plans to visit each place starting from her home.

1. What is the abscissa of the park's location?
2. What is the ordinate of the library's location?
3. Which quadrant does the school lie in?
4. Sneha walks from her home to the school. In which direction does she move along the x-axis?

34. Amita is exploring the properties of angles formed by two intersecting lines PQ and RS at point O. The angles formed are labeled as ∠POR, ∠QOS, ∠SOP and ∠QOR. She finds that ∠POR=35.

i). What is the measure of ∠SOP, if ∠POR is 35°?

ii). What is the relationship between ∠POR and ∠QOS?

(a) Complementary angles (b) supplementary angles

(c) Vertically opposite angles (d) adjacent angles

iii). If ∠POR is 35°, what is the measure of ∠QOS?

iv). If ∠POR is 35° and ∠QOR is 145°, what is the relationship between these two angles?

(a) complementary angles (b) linear pair of angles

(c) vertically opposite angles (d) none of these.

SECTION-E (5 MARKS EACH)

35. (a) Is zero a rational number? Can you write it in the form p/q where p and q are integers and $q \neq 0$?

(b) Express $0.6\overline{23}$ in the form p/q, where p and q are integers and $q \neq 0$.

36. (a) Factorise: $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8xz$

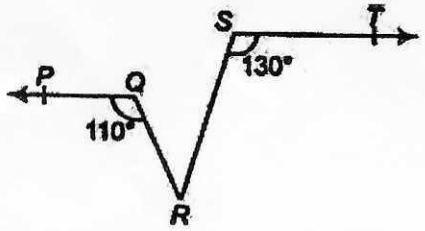
(b) Without actually calculating the cubes, find the value of $(-12)^3+(7)^3+(5)^3$.

37.(a) Find the value of k, if $x = 2$, $y = -1$ is a solution of the equation $2x+ky = -4$.

(b)Express the following linear equation in the form $ax + by + c = 0$ and

indicate the values of a, b and c in $x = 3y$.

38.(a) In adjoining fig., if PQ || ST, ∠PQR = 110° and ∠RST = 130°, find ∠QRS.



(b) Prove that vertically opposite angles are equal.