INDIAN SCHOOL AL WADI AL KABIR
Post Mid-term Examination (2025-26)
Sub: MATHEMATICS

Class: IX Set 1 Max marks: 80
Date: 07-12-2025 Time: 3 hours

***General Instructions:***

(i) This question paper has 8 printed pages.

(ii) This question paper contains 38 questions divided into five Sections A, B, C, D and E. All questions are compulsory.

(iii) Section A- Part 1 (MCQ) comprises of 18 questions of 1 mark each.

(iv) Section A- Part 2 (Assertion and Reason) comprises of 2 questions of 1 mark each.

(v) Section B -Very short answer (VSA) comprises of 5 questions of 2 marks each.

(vi) Section C - Short answer (SA) comprises of 6 questions of 3 marks each.

(vii) Section D - Long answer (LA) comprises of 4 questions of 5 marks each.

(viii) Section E – 3 case study-based questions carrying **4** marks each. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and 3 questions in Section E.

**SECTION A – Part – 1 MCQ (1 mark each)**

**Q.1.** Which one of the following numbers is irrational?

**(A)** 0.379 **(B)** 0.171771777… **(C)** 0.454545… **(D)** 2.478478

**Q.2.** A point whose abscissa is 5 and lies on the $x$-axis is

**(A)** (5,0) **(B)** (0,5) **(C)** $(-5,0)$ **(D)** (0, -5)

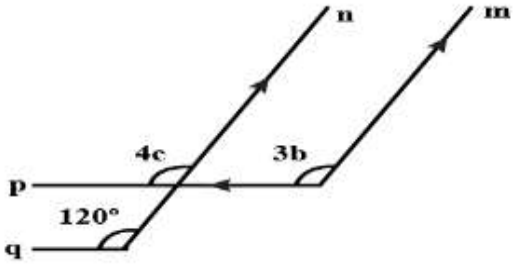
**Q.3.** The number of lines that can be drawn through two distinct points is

**(A)** infinite **(B)** one **(C)** two **(D)** three

**Q.4.** Which one of the following expressions represents a polynomial?

**(A)** $6x^2 + 5\sqrt{x} + 1$ **(B)** $\sqrt{3}x^2 - x - 1$ **(C)** $\frac{3}{x} + 2$ **(D)** $5x - \frac{1}{x^2}$

**Q.5.** If $p \parallel q$ and $m \parallel n$, then the value of **b** is




**(A)** 30° **(B)** 80° **(C)** 120° **(D)** 40°

**Q.6.** $\sqrt{10}$ x $\sqrt{15}$ is equal to

**(A)** $6\sqrt{5}$ **(B)** $5\sqrt{6}$ **(C)** $6\sqrt{10}$ **(D)** $10\sqrt{5}$

**Q.7.** In a frequency distribution, the class mark of a class is 15 and the class size is 4. The lower limit of the class is:

**(A)** 17 **(B)** 12 **(C)** 13 **(D)** 14

**Q.8.** The base of a right - angled triangle is 8 cm and the hypotenuse is 17 cm. Then its area is

**(A)** $60cm^2$ **(B)** $40cm^2$ **(C)** $48cm^2$ **(D)** $68cm^2$

**Q.9.** If the linear equation has solutions (-3, 3), (0, 0) and (3, -3), then the equation is

**(A)** x – y = 0 **(B)** 2x – y = 0 **(C)** x + y = 0 **(D)** x + 2y = 0

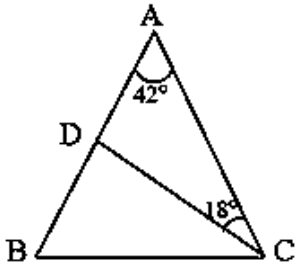
**Q.10.** If two supplementary angles are $(4x - 10)°$ and $(6x + 40)°$, then the value of the larger angle is

**(A)** 140° **(B)** 120° **(C)** 135° **(D)** 130°

**Q.11.** A set of data consists of 64 as the lowest value and its range is 13. Then the highest value of the data is:

**(A)** 13 **(B)** 77 **(C)** 46 **(D)** 61

**Q.12.** In the given figure, AB = AC, ∠A = 42° and ∠ACD = 18°. The measure of ∠BCD is




**(A)** 55° **(B)** 69° **(C)** 45° **(D)** 51°

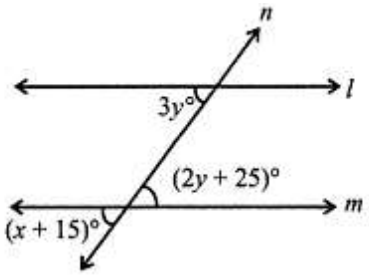
**Q.13.** The linear equation 2x – 5y = 7 has

**(A)** a unique solution **(B)** two solutions **(C)** infinitely many solutions **(D)** no solution

**Q.14.** If the area of an equilateral triangle is $100\sqrt{3}cm^2$ then perimeter of the triangle is

**(A)** 50 cm **(B)** 70 cm **(C)** 90 cm **(D)** 60 cm

**Q.15.** In figure, if l ‖ m, then the value of x is




**(A)** 120° **(B)** 75° **(C)** 60° **(D)** 40°

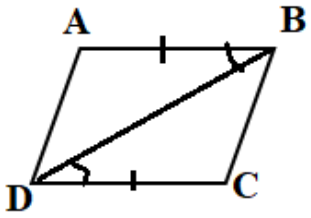
**Q.16.** The adjusted frequency of the class interval 100–160 is 18. If the minimum class size is 20, then the original frequency of this class interval is

**(A)** 72 **(B)** 6 **(C)** 9 **(D)** 54

**Q.17.** If P (a, b) lies in the II quadrant, then which of the following is true about a and b?

**(A)** a > 0, b > 0 **(B)** a > 0, b < 0 **(C)** a < 0, b > 0 **(D)** a < 0, b < 0

**Q.18.** In the figure, AB = CD, $\angle ABD = \angle CDB$, then the congruence rule applied to prove $\triangle$ ABD $\cong \triangle$ CDB is




**(A)** RHS **(B)** SSS **(C)** SAS **(D)** ASA

**Part – 2 Assertion and Reason (1 mark each)**

DIRECTION: Two statements are given, one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

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

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is ***not*** the correct explanation of Assertion (A)

(c) Assertion (A) is true, but reason (R) is false.

(d) Assertion (A) is false, but reason (R) is true.

**Q.19.** **Assertion (A):** Point (0, –2) lies on y-axis.

**Reason (R):** The perpendicular distance of the point (4, 3) from the x-axis is 4.

**Q.20.** **Assertion (A):** In the class intervals 10 – 20 and 20 – 30, the observation 20 is included in the class interval 20 – 30.

**Reason (R):** The lower limit of the class interval is always included in the interval.

**SECTION B (2 marks each)**

**Q.21.** (a) If a + b + c = 9 and ab + bc + ca = 26, then find the value of $a^2 + b^2 + c^2$

**OR**

(b) Without actually calculating the cubes, find the value of $(20)^3 + (-12)^3 + (-8)^3$. Give reason.

**Q.22.** Twice the cost of a pen is equal to three times the cost of a pencil. Express the statement as a linear equation in two variables in the form ax + by + c = 0. (Take the cost of a pen to be ₹ x and that of a pencil to be ₹ y). Also indicate the values of a, b and c.

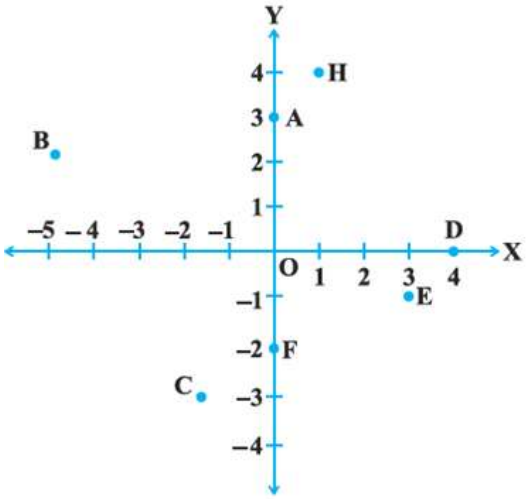
**Q.23.** Observe the given fig. and answer the following questions:

(i) The coordinates of the point H.

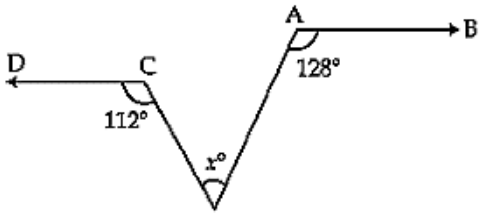
(ii) Abscissa of point E.

(iii) The point identified by coordinates (-2, -3)

(iv) Ordinate of point F

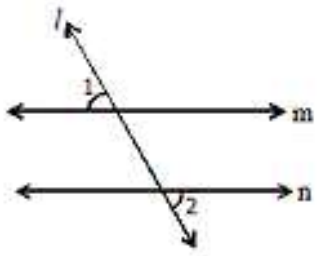



**Q.24.** (a) In the given figure AB ‖ CD. Find the value of x.




**OR**

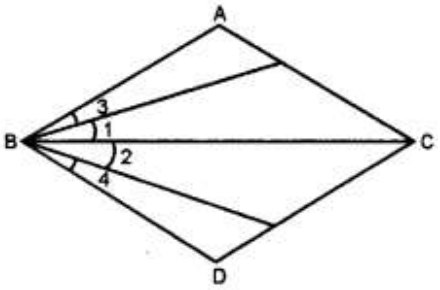
(b) In the figure $\ell$ is transversal to the lines m and n such that $\angle 1 = 60^\circ$ and $\angle 2 = \frac{2}{3}$ of a right angle. Prove that m ∥ n.




**Q.25.** In the given figure, $\angle 1 = \angle 2$ and $\angle 3 = \angle 4$.

Show that $\angle ABC = \angle DBC$.

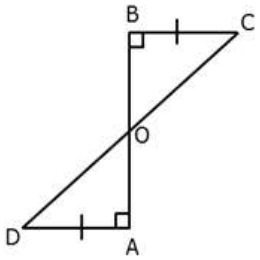
State the Euclid's axiom used.




## SECTION C (3 marks each)

**Q.26.** Find the values of a and b, if $\frac{5 + 2\sqrt{3}}{7 + 4\sqrt{3}} = a + b\sqrt{3}$

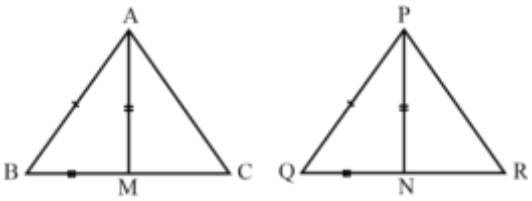
**Q.27** (a)In the given figure, AD and BC are equal perpendiculars to a line segment AB. Show that CD bisects AB.




**OR**

(b)Two sides AB and BC and median AM of one triangle ABC are respectively equal to sides PQ and QR and median PN of Δ PQR. Show that:

(i) Δ ABM ≅ Δ PQN (ii) Δ ABC ≅ Δ PQR



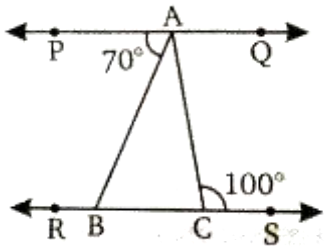

**Q.28.** The three vertices of a rectangle are (3, 2), (−4, 2) and (−4, 5). Plot these points on the graph. Find the coordinates of the fourth vertex and the area of the rectangle so formed.

**Q.29.** (a) The sides of a triangular plot are in the ratio of 13: 14: 15 and its perimeter is 84 m. Find its area.

**OR**

(b) Find the area of a triangle whose perimeter is 180cm and its two sides are 80cm and 18cm. Calculate the altitude of the triangle corresponding to its shortest side.

**Q.30.** In fig. PQ ‖ RS, ∠PAB = 70° and ∠ACS = 100°. Determine ∠ABC, ∠BAC and ∠CAQ




**Q.31.** Find the value of k, for which the linear equation 2x + ky = 8 has x = 2 and y = 1 as its solution. Also, if x = 4, then find the value of y.

**SECTION D (5 marks each)**

**Q.32.**

(a) Factorise completely: $x^3 - 8x^2 + 5x + 14$

**OR**

(b) If the polynomial $3x^3 + px^2 - 11x + 3$ is exactly divisible by (x – 1), then find the value of p**.** Hence, factorize the polynomial.

**Q.33.** (a) (i) Simplify and find the value of $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt[5]{32} + \sqrt{225}$

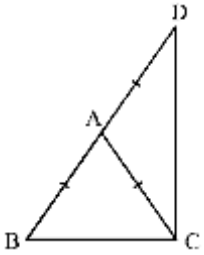
(ii) Represent $\sqrt{5}$ on the number line.

**OR**

(b) Evaluate: $\left(\frac{81}{16}\right)^{-\frac{3}{4}} \times \left[\left(\frac{9}{25}\right)^{\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$

**Q.34.** (i) Prove that angles opposite to equal sides of an isosceles triangle are equal.

(ii)In the given figure, ΔABC is an isosceles triangle in which AB = AC. Side BA is produced to a point D such that AD = AB. Show that ∠ BCD is a right angle.




**Q.35.** Draw a frequency polygon with histogram for the following data:

| Marks | 0 - 10 | 10 - 20 | 20 – 30 | 30 - 40 | 40 - 50 | 50 - 60 |
|---|---|---|---|---|---|---|
| No. of students | 3 | 5 | 8 | 10 | 7 | 2 |

**SECTION E (Case study- based questions of 4 marks each)**

**Q.36.** **<u>Case Study – 1</u>**

A modern art museum is installing a series of triangular sculptures as part of a geometry-themed exhibition. The design team installed the following sculptures:

Isosceles Triangular Sculpture with two equal sides of 10 m each and a base of 12 m. Equilateral Triangular Wall Panels of side 9 m mounted on the walls**.**

Based on the above information, answer the following questions:

(i) Find the semi-perimeter of the equilateral triangle of side 9 m. 1m

(ii) If the cost of material required for the sides of the isosceles triangular sculpture is ₹300 per meter, find the total cost of all three sides. 1m

(iii) (a) Find the area of the isosceles triangular sculpture using Heron's formula. 2m

**OR**

(iii) (b)If three equilateral triangular panels are mounted on the wall, find the total area covered by them. 2m

**Q.37.** **Case Study- 2**

During the Annual Community Garden Drive, Class IX students worked with community volunteers to redesign the neighbourhood garden. As part of their work, students measured garden plots and walking paths, and many irregular shapes required measurements involving square roots and real numbers.

Based on the above information, answer the following questions:

(i) The number of saplings planted was represented by the expression $(12 + 3\sqrt{7})\,(12 - 3\sqrt{7})$. Find the total number of saplings planted. 1m

(ii) The area of the flower bed is given by the expression $(4\sqrt{3} + 2\sqrt{5})^2$ m². Find the area by simplifying the expression. 1m

(iii) (a)Students recorded an average water requirement of $0.72\overline{3}$ litres per sapling. Express $0.72\overline{3}$ in $\frac{p}{q}$ form, where p and q are integers and q ≠ 0 2m

**OR**

(iii) (b) Find the value of $x$ if $5^{x-3} \times 3^{2x-8} = 225$. 2m

**Q.38.** **Case Study- 3**


Sara, a student of Class IX, visited her school's STEM lab to purchase a Robotics Mini-Kit for her activity class. The kit consists of two main components: a sensor module and a battery pack.

The lab manager informed Sara that the total cost of the kit can be expressed as a polynomial: $p(x) = 6x^2 + 7x - 3$.

Based on the above information, answer the following questions:

(i) Find the value of the given polynomial p(x) at x = −2. 1m

(ii) (a)Find the possible expressions for the individual price of the sensor module and the battery pack. 2m

**OR**

(ii) (b) Find the value of $8x^3 + 27y^3$, if $2x + 3y = 8$ and $xy = 2$. 2m

(iii) Find the value of $525^2 - 475^2$ using suitable identity. 1m

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