INDIAN SCHOOL AL WADI AL KABIR

Post Mid-term Examination (2025-26)

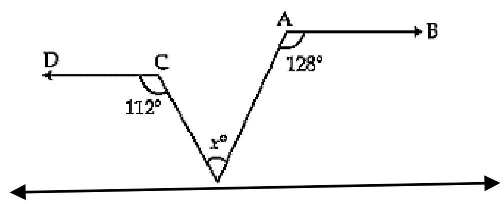
Class: IX | MARKING SCHEME - Set 1 | Date: 07-12-2025

SECTION A: Part 1 - MCQ (1 mark each)

Q.1.	(B) 0.171771777…	Q.11.	(B) 77
Q.2.	(A) (5,0)	Q.12.	(D) 51°
Q.3.	(B) one	Q.13.	(C) infinitely many solutions
Q.4.	(B) $\sqrt{3}x^2 - x$ - 1	Q.14.	(D) 60 cm
Q.5.	(D) 40°	Q.15.	(C) 60°
Q.6.	(B) $5\sqrt{6}$	Q.16.	(D) 54
Q.7.	(C) 13	Q.17.	(C) a < 0, b > 0
Q.8.	(A) $60cm^2$	Q.18.	(C) SAS
Q.9.	(C) x + y = 0	Q.19.	(c) (A) is true, but (R) is false.
Q.10.	(D) 130°	Q.20.	(a) Both (A) and (R) are true and (R) is the correct explanation of (A)

SECTION B

Q.21.	(a) $(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$ ---------- (1) $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$	½

	So, $81 = a^2 + b^2 + c^2 + 2(26)$ ½ $81 = a^2 + b^2 + c^2 + 52$ ½ $a^2 + b^2 + c^2 = 81 - 52$ ½ $a^2 + b^2 + c^2 = 29$ Therefore, $a^2 + b^2 + c^2 = 29$ **OR** x + y + z = 20 + (-12) + (-8) = 0 (1/2) x + y + z = 0 ⇒ $x^3 + y^3 + z^3$ = 3xyz $(20)^3 + (-12)^3 + (-8)^3$ = 3 × 20 × (-12) × (-8) (1) = 5760 (1/2)
Q.22.	Let the cost of one pen be ₹ x and the cost of one pencil be ₹ y. The required linear equation is 2x = 3y (1) 2x – 3y + 0 = 0 (1/2) Here a = 2, b = -3 and c = 0 (1/2)
Q.23.	(i) The coordinates of the point H: (1, 4) (ii) Abscissa of point E: 3 (iii) The point identified by coordinates (-2, -3) is C (iv) Ordinate of point F is -2 (1/2 x 4 = 2)
Q.24.	 X P Y (1/2) ∠ XPC = 180 ˚ - 112 ˚ = 68 ˚ ∠ YPA = 180 ˚ - 128 ˚ = 52 ˚ (co-interior angles) (1/2 + 1/2) 68 ˚ + x + 52 ˚ = 180 ˚ (angles on a straight line), x = 60 ˚ (1/2) **OR** ∠ 1 = 60˚, ∠2 = $\frac{2}{3}$ x 90˚ = 60˚ 1 Since alternate exterior angles are equal, the lines are parallel 1 (Or any other parallel lines property)
Q.25.	∠1 = ∠2 and ∠3 = ∠4. ∠1 + ∠3 = ∠2 + ∠4. (1) ∠ABC = ∠DBC. (If equals are added to equals, then the wholes are equal) (½ + ½)

SECTION C (3 marks each)		
Q.26	$\frac{5+2\sqrt{3}}{7+4\sqrt{3}} \times \frac{7-4\sqrt{3}}{7-4\sqrt{3}} = \frac{35-20\sqrt{3}+14\sqrt{3}-8(3)}{1}$	(2)
	$= \frac{11-6\sqrt{3}}{1} = 11-6\sqrt{3}$	(1/2)
	a = 11, b = -6	(1/2)
Q.27.	Given, to prove	(1/2)
	In Δ AOD and Δ BOC	
	$\angle OAD = \angle OBC = 90°$ (given)	
	$\angle AOD = \angle BOC$ (vertically opposite angles)	
	AD = BC (given)	
	∴ Δ AOD ≅ Δ BOC (AAS congruence)	(2)
	AO = BO (CPCT)	(1/2)
	Hence, CD bisects AB.	
	OR	
	(i) In ΔABC, AM is the median to BC.	
	∴ BM = 1/2 BC	
	In ΔPQR, PN is the median to QR.	
	∴ QN = 1/2 QR	
	It is given that BC = QR	
	∴ 1/2 BC = 1/2 QR	
	∴ BM = QN ... (1)	
	In ΔABM and ΔPQN,	
	AB = PQ (Given)	
	BM = QN [From equation (1)]	
	AM = PN (Given)	
	∴ ΔABM ≅ ΔPQN (Using SSS congruence criterion)	2

⇒ ∠ABM = ∠PQN (By CPCT)

⇒ ∠ABC = ∠PQR … (2)

(ii) In Δ ABC and Δ PQR ,

AB = PQ (Given)

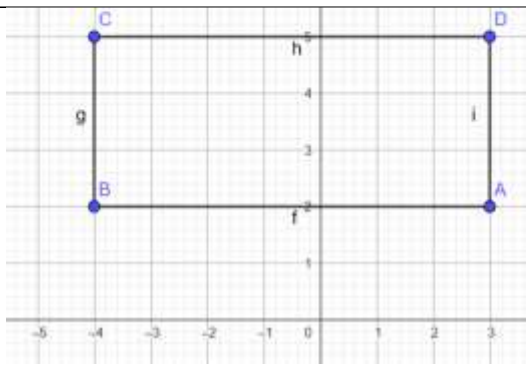
∠ABC = ∠PQR [From Equation (2)]

BC = QR (Given)

∴ ΔABC ≅ ΔPQR (By SAS congruence rule)

1

Q.28.



Plotting points 1 ½

Join points ½

Fourth vertex (1/2)

Area (1/2)

Coordinates of the fourth vertex D are (3, 5). Area of rectangle = l x b = 7 x 3 = 21 sq. units

Q.29.

a) Let the sides be 13x, 14x and 15 x

13x + 14x + 15x = 84 42x = 84; x = 2 (1/2)

The sides are 26m, 28m and 30m (1/2)

$s = \frac{84}{2} = 42m$ (1/2)

$A = \sqrt{s(s-a)(s-b)(s-c)}$ (1/2)

$= \sqrt{42\,(42-26)(\,42-28)(42-30)}$

$= \sqrt{42 \times 16 \times 14 \times 12}$ (1/2)

$= \sqrt{7 \times 6 \times 16 \times 7 \times 2 \times 6 \times 2}$

$= 7 \times 6 \times 4 \times 2 = 336\ m^2$ (1/2)

OR

a = 80cm, b = 18cm, P = 180cm, s = 90cm ½

c = 180 – (80 + 18) = 82cm ½

$A = \sqrt{s(s-a)(s-b)(s-c)}$ ½

$= \sqrt{90\,(90-80)(\,90-18)(90-82)}$ ½

$= \sqrt{90 \times 10 \times 72 \times 8} = 720\ cm^2$ ½

	$\frac{1}{2}$ x 18 x h = 720 cm^2, h = 80cm	½
Q.30.	∠ABC = 70° (alternate interior angles) ∠CAQ = 80° (co-interior angles) ∠BAC = 30° (angles on a straight line)	1 1 1
Q.31.	Given 2x + ky = 8 2 x 2 + k x 1 = 8; 4 + k = 8, k = 4 2 x 4 + 4 x y = 8, 8 + 4y = 8, 4y = 0, y = 0	 (1 ½) (1 ½)
SECTION D		
Long answer (LA) type questions of 5 marks each.		
Q.32.	(a) p(x) = x^3 - 8x^2 + 5x + 14 p (2) = 2^3 - 8 x$(2)^2$ + 5 x 2 + 14 = 8 – 32 + 10 + 14 = 0 (1m) p (2) = 0 ⇒ (x - 2) is a factor of p(x) [factor theorem] (1/2) 2 | 1 -8 5 14 0 2 -12 -14 (1m) 1 -6 -7 0 ---------------remainder Now factorise x^2 - 6 x – 7 (1m) x^2 - 6 x – 7 = x^2 - 7x + x – 7 = x (x – 7) + 1 (x – 7) = (x – 7) (x + 1) (1m) p(x) = (x + 1) (x – 2) (x – 7) (1/2) **OR** p(x) = 3x^3 + **p**x^2 – 11x + 3 is exactly divisible by (x – 1) ⇒ p(1) = 0 3x 1^3 + p x 1^2 – 11 x 1 + 3 = 0 3 + p – 11 + 3 = 0; p = 5 (1) 1 | 3 5 -11 3 0 3 8 -3 (1 ½) 3 8 -3 0 --------------remainder Now factorise 3x^2 + 8x – 3 (1/2) 3x^2 + 8x – 3 = 3x^2 + 9x – x – 3 (1/2) = 3x (x + 3) – 1 (x + 3) (1/2) = (x + 3) (3x – 1) (1/2) p(x) = (x – 1) (x + 3) (3x – 1) (1/2)	

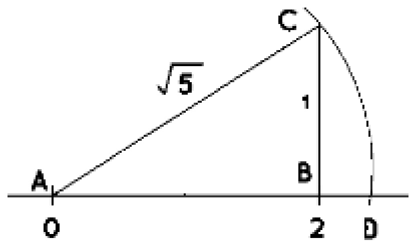
Q.33.

(a) (i) $\sqrt[4]{81} - 8\sqrt[3]{216} + 15\sqrt[5]{32} = (81)^{\frac{1}{4}} - 8 \times (216)^{\frac{1}{3}} + 15 \times (32)^{\frac{1}{5}} + 15$ (2)

$= 3 - 8 \times 6 + 15 \times 2 + 15$ (1/2)

$= 3 - 48 + 30 + 15 = 0$ (1/2)

(ii)



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OR

(b)

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

$$= \left(\frac{3^4}{2^4}\right)^{-\frac{3}{4}} \times \left[\left(\frac{3^2}{5^2}\right)^{\frac{3}{2}} \div \left(\frac{5}{2}\right)^{-3}\right]$$ (1 ½)

$$= \left(\frac{3}{2}\right)^{-3} \times \left[\left(\frac{3}{5}\right)^{3} \div \left(\frac{5}{2}\right)^{-3}\right]$$ (1)

$$= \left(\frac{3}{2}\right)^{-3} \times \left[\left(\frac{3}{5}\right)^{3} \div \left(\frac{2}{5}\right)^{3}\right]$$ (1)

$$= \left(\frac{3}{2}\right)^{-3} \times \left[\left(\frac{3}{5}\right)^{3} \times \left(\frac{5}{2}\right)^{3}\right] = \left(\frac{3}{2}\right)^{-3} \times \left[\left(\frac{3}{5} \times \frac{5}{2}\right)^{3}\right]$$ (1)

$$= \left(\frac{3}{2}\right)^{-3} \times \left(\frac{3}{2}\right)^{3} = \left(\frac{3}{2}\right)^{0} = 1$$ (1/2)

Q.34.

(i) Given, to prove, figure, construction (1 ½)

Proof (1 ½)

(ii) AB = AC, AD = AB ⇒ AD = AC

In ΔABC,

AB = AC

⇒ ∠ACB = ∠ABC *(Angles opposite to equal sides are equal)* ...(1)

In ΔACD,

AC = AD

∠ADC = ∠ACD (Angles opposite to equal sides are equal) ...(2)

½

½

	In ΔBCD, ∠ABC + ∠BCD + ∠BDC = 180° *(Angle sum property of triangle)* ∠ACB + ∠ BCD + ∠ACD = 180° *(From (1) & (2))* (∠ACB +∠ACD) + ∠ BCD = 180° (∠ BCD) + ∠ BCD = 180° 2∠ BCD = 180° ∠ BCD = $\frac{180°}{2}$ ∠ BCD = 90° Hence proved	½ ½
Q.35.	Histogram (3m) Frequency polygon (2m)	

SECTION E (4 marks each)

Q.36.

(i)	Semi-perimeter = $\frac{9+9+9}{2}$ = 13.5m	1m
(ii)	Perimeter = 10 + 10 + 12 = 32m Total cost = 32 x 300 = ₹ 9600	1m
(iii) (iii)	(a) s = $\frac{\mathbf{10+10+12}}{\mathbf{2}}$ = 16m (1/2) A =$\sqrt{\boldsymbol{s\,(s-a)(\,s-b)(s-c)}}$ (1/2) = $\sqrt{16\ \times 6\ \times 6\ \times 4}$ = 4 x 6 x 2 = 48 m^2 (1) **OR** (b) Area of an equilateral triangle = $\frac{\sqrt{3}}{4}a^2 = \frac{\sqrt{3}}{4} \times 9^2 = 81\,\frac{\sqrt{3}}{4}\,m^2$ (1) Area of 3 equilateral triangles = $3 \times 81\,\frac{\sqrt{3}}{4}\,m^2$ = $243\,\frac{\sqrt{3}}{4}\,m^2$ (1)	2m 2m

Q.37.

(i)	$(12 + 3\sqrt{7})\,(12 - 3\sqrt{7})$ = 144 – 63 = 81	1m
(ii)	$(4\sqrt{3} + 2\sqrt{5})^2$ = 48 + 16 $\sqrt{15}$ + 20 = 68 + 16 $\sqrt{15}$ m²	1m
(iii) (iii)	a) Let x = 0.723333… ----------------(1) (1/2) (1) x 100 ⇒ 100x = 72.3333… ------------(2) (2) x 1000 ⇒ 1000x = 723.333… ----------(3) (1/2) (3) - (2) ⇒ 1000x – 100x = 723 - 72 900x = 651 (1/2) x = $\frac{651}{900} = \frac{217}{300}$ (1/2) **OR** (b) $5^{x-3} \times 3^{2x-8}$ = 225.	2m 2m

		$5^{x-3} \times 3^{2x-8} = 5^2 \times 3^2$ (1) Equating the powers, x – 3 = 2 and 2x – 8 = 2 (1/2) (a) On solving, we get x = 5 (1/2)		
Q.38.	(i)	$6x^2 + 7x - 3 = 6(-2)^2 + 7(-2) - 3$ (1/2) = 24 – 14 – 3 = 7 (1/2)	1m
	(ii)	(a) $6x^2 + 7x - 3 = 6x^2 + 9x - 2x - 3$ (1) = 3x (2x + 3) -1 (2x – 3) (1/2) = (2x + 3) (3x – 1) (1/2)	2m
	(ii)	**OR** (b) $(2x+3y)^3 = 8x^3 + 27y^3$ + 3 x 2 x x 3y (2x + 3y) (1/2) $8^3 = 8x^3 + 27y^3$ + 18xy (2x + 3y) (1/2) 512 = $8x^3 + 27y^3$ + 18 x 2 x 8 (1/2) $8x^3 + 27y^3 = 512 - 288 = 224$ (1/2)	2m
	(iii)	$525^2 - 475^2$ = (525 + 475) (525 – 475) (1/2) = 1000 x 50 = 50000 (1/2)	1m

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