INDIAN SCHOOL AL WADI AL KABIR

Mid-term Examination (2025-26)

Sub: MATHEMATICS (041)

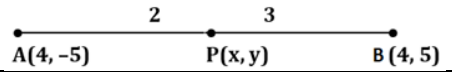
Date: 16-09-2025 **Set 1** Maximum marks: 80

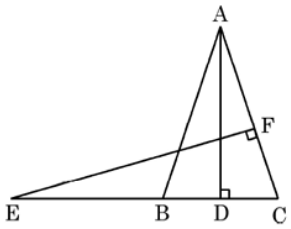
Class: X Time: 3 hours

SECTION A

This section comprises multiple choice questions (MCQs) of 1 mark each.

Q.1.	(B) 1:2
Q.2.	(A)2
Q.3.	(D) ab=6
Q.4.	(A)$x^2 - 4x + 1 = 0$
Q.5.	(C) $\angle B = \angle D$
Q.6.	(A) $\frac{-17}{7}$
Q.7.	(D) $2\sqrt{10}\ units$
Q.8.	(C) 30-40
Q.9.	(B) $\frac{3}{4}$
Q.10.	(C) rational number
Q.11.	(D) 0
Q.12.	(A) $(0, -3)$
Q.13.	(C) 0.1
Q.14.	(B)2.5 cm
Q.15.	(D) 60°
Q.16.	(B)$\sqrt{13}\ units$
Q.17.	(A) 21k
Q.18.	(C) $2^5 \times 3^2$
Q.19.	Ans: d
Q.20.	Ans: C.
Q.21.	Let us assume $5 - 2\sqrt{3}$ be rational number $5 - 2\sqrt{3} = \frac{a}{b}$ ---------- ½ $-2\sqrt{3} = \frac{a-5b}{b} \Rightarrow \sqrt{3} = \frac{a-5b}{-2b}$ or $\sqrt{3} = \frac{5b-a}{2b}$ ---------- ½ Here LHS= irrational and RHS= Rational, $\Rightarrow$ LHS≠ RHS ---------- ½ This contradiction has arisen due to our wrong assumption $\therefore 5 - 2\sqrt{3}$ is an irrational number ---------- ½ **(OR)** (b) Find the greatest number which divides 85 and 72 leaving remainders 1 and 2 respectively. We have to find HCF of 85 – 1 = 84 and 72 – 2 = 70. ---------- 1 HCF of 84 and 70 = 14 ----------1

Q.22.	$5x - 3y = 11, \quad -10x + 6y = 22$ Solution: $-\frac{5}{10} = -\frac{3}{6} \neq \frac{11}{22} \Rightarrow -\frac{1}{2} = -\frac{1}{2} \neq \frac{1}{2}$ ---------- 1 ½ $\Rightarrow$ given pair of linear equations is inconsistent ---------- ½
Q.23.	For real and equal roots $4(m-1)^2 - 4(m-1) = 0$ $\Rightarrow m = 1$ or $m = 2$ $m \neq 1 \Rightarrow m = 2$ ½ 1 ½
Q.24	sin (A – B) = 0 $\Rightarrow$ A – B = 0° ---------- ½ cos (A + B) = 1/2 $\Rightarrow$ A + B = 60° ---------- ½ $\Rightarrow$ A = 30°, B = 30° ---------- 1
Q.25.	(a)Let the given points be A (– 2, 3), B (8, 3) and C (6, 7) Then, AB = 10, BC = $\sqrt{4+16} = \sqrt{20}$ ----------1 AC = $\sqrt{64+16} = \sqrt{80}$ ---------- ½ $\therefore$ $AB^2 = BC^2 + AC^2$ $\therefore$ the given points are the vertices of a right-angled triangle. ---------- ½ **OR** (b) AP : AB = 2 : 5 $\Rightarrow$ AP : PB = 2 : 3 ---------- ½ x = $\frac{8+12}{5}$ = 4, y = $\frac{10-15}{5}$ **5** = – 1 ---------- 1 Point P is (4, – 1) ---------- ½ 
SECTION C	
This section comprises of short answer (SA) type questions of 3 marks each.	
Q.26.	$\alpha + \beta = -\frac{5}{3}$ and $\alpha\beta = \frac{k}{3}$ $\alpha^2 + \beta^2 + \alpha\beta = \frac{19}{9} \Rightarrow (\alpha+\beta)^2 - \alpha\beta = \frac{19}{9}$ $\frac{25}{9} - \frac{k}{3} = \frac{19}{9} \Rightarrow \frac{k}{3} = \frac{2}{3}$ $\Rightarrow k = 2$ ½ 1 1 ½
Q.27.	Let two digit number = 10x + y ---------- ½ x + y = 10 ...(i) ---------- ½ 10x + y – 18 = 10y + x $\Rightarrow$x – y = 2 ...(ii) ---------- 1 On solving (i) & (ii) x = 6, y = 4 ---------- ½ $\therefore$ Required number = 64 ---------- ½ **OR** Let number of questions answered correctly be x and number of questions answered wrong be y

	Therefore 3x – y = 40 ---------- 1 and 4x – 2y = 40 ---------- ½ solving, x = 20, y = 20 ---------- 1 Total number of questions = x + y = 40. ---------- ½	
Q.28.	 ABC is an isosceles triangle $\therefore AB=AC \Rightarrow \angle B=\angle C$ ---------- 1 In Δ ABD and Δ ECF, ∠ ADB = ∠ EFC = 90 ----------1 ∠ ABD = ∠ ECF (given)---------- ½ ∴ Δ ABD ~ Δ ECF By AA similarity criteria ---------- ½	
Q.29.	$4\cot^2 45° - \sec^2 60° + \sin^2 60° + p = \frac{3}{4}$ $\Rightarrow 4(1)^2 - (2)^2 + \left(\frac{\sqrt{3}}{2}\right)^2 + p = \frac{3}{4}$ $\Rightarrow 4 - 4 + \frac{3}{4} + p = \frac{3}{4}$ $\Rightarrow p = 0$	1½ ½ ½ ½
Q.30.	Ans: p=21, ---------- each ½ mark q=21+13=34, 34+r=50 $\Rightarrow$ r=16, s=50+11==61 t+61=66 $\Rightarrow$ t=5 66+u=77 $\Rightarrow$ u=11	
Q.31.	$3x^2 - 10x - 8$ $\Rightarrow 3x^2 - 12x - 2x - 8$ $\Rightarrow$3x(x-4)+2(x-4) (3x+2)(x-4) $\Rightarrow$ x = -2/3 and x = 4 $\Rightarrow \alpha = -\frac{2}{3}$, $\beta = 4$ Verification: Sum of zeroes $= \alpha + \beta = -\frac{b}{a}$ Product of zeroes $= \alpha \cdot \beta = \frac{c}{a}$	½ 1 1 ½

$\alpha + \beta = 4 + \left(-\frac{2}{3}\right) = \frac{10}{3}$

$-\frac{b}{a} = -\frac{-10}{3} = \frac{10}{3}$

$\alpha\beta = 4 \cdot \left(-\frac{2}{3}\right) = -\frac{8}{3}$

$\frac{c}{a} = \frac{-8}{3} = -\frac{8}{3}$ **OR**

b)

Let α,β are the two zeros of the polynomial ax^2+bx+c
Then, α+β=-b/a and αβ=c/a
By the given condition, β=2α
∴, α+2α=-b/a
or, 3α=-b/a
or, α=-b/3a -------(1) and
α.2α=c/a
or, $2\alpha^2$=c/a
or, α^2=c/2a
or, $(-b/3a)^2$=c/2a [using (1)]
or, $b^2/9a^2$=c/2a
or, $b^2/9a$=c/2
or, $2b^2$=9ac (Proved)

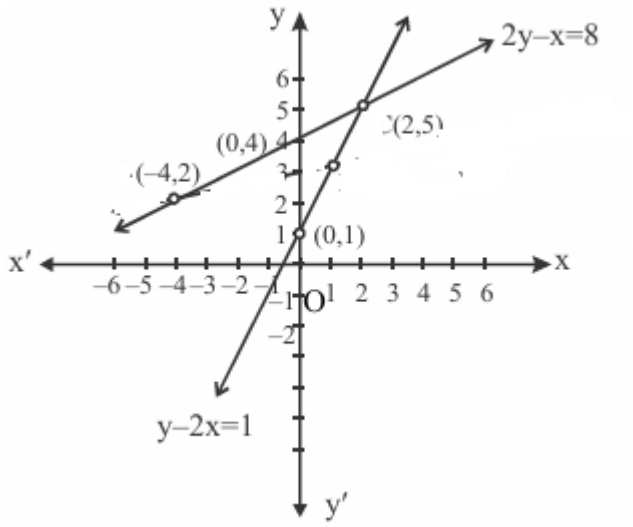
½

1

½

1

Q.32.



$2y - x = 8$

x	0	2	–4
y	4	5	2

$y - 2x = 1$

x	1	2	0
y	3	5	1

Number line ½ m

Graph plotting

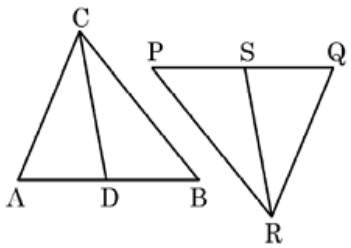
each 2+2 m

Writing the coordinates of triangle - ½ mark

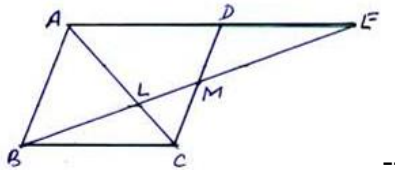
The coordinates of triangle are(2,5) (-0.5,0) (-8,0)

Q.33.

(i) Δ ABC ~ Δ PQR
⇒ ∠ A = ∠ P and ----------1
AB/PQ = AC/PR ---------- ½
⇒ $\frac{2AD}{2PS} = \frac{AC}{PR}$ ---------- ½
⇒ $\frac{AD}{PS} = \frac{AC}{PR}$ and ∠ A = ∠ P ----------1
Therefore Δ ADC ~ Δ PSR ---------- ½
(ii)Hence $\frac{AD}{PS} = \frac{AC}{PR}$ ⇒ AD × PR = AC × PS ----------1 ½



OR



---------- 1 for correct figure

In Δ BMC and Δ EMD
MC = MD
∠ CMB = ∠ EMD
∠ MBC = ∠ MED
∴ Δ BMC ≅ Δ EMD by AAS congruence criteria ---------- 1 ½
⇒ BC = DE
But AD = BC
∴ AD = DE
⇒ AE = 2 BC
Δ AEL ~ Δ CBL ---------- 1
∴ $\frac{EL}{BL}=\frac{AE}{BC}\Rightarrow\frac{EL}{BL}=\frac{2BC}{BC}\Rightarrow\frac{EL}{BL}=2\Rightarrow$ EL = 2 BL ---------- 1 ½

Q.34.

1) A (0,0) B (30,0), C (30,48), D (0,48) ----------2 m
2) P (4,16), Q (16,32) ---------- 1 m
PQ = $\sqrt{12^2+16^2}=\sqrt{144+256}=\sqrt{400}=\boxed{20\text{ m}}$ ---------- 1 m
3)Mid-point of PQ=$\left(\frac{4+16}{2},\frac{16+32}{2}\right)$=(10,24) ----------1m

Q.35.

Class	x	f	$d=x-125$	fd
100–110	105	4	–20	–80
110–120	115	12	–10	–120
120–130	125	23	0	0
130–140	135	8	10	80
140–150	145	3	20	60
		50		–60

Correct Table — 2

$\bar{x}=125-\frac{60}{50}=123\cdot8$ — 1

(a) ∴ Mean Weight of animals is 123.8kg

Mode:
Modal class = 120-130, l= 120, h=10, $f_0=12, f_1=23, f_2=8$,

$$\text{Mode}=l+\frac{f_1-f_0}{2f_1-f_0-f_2}h$$
$$=120+\frac{23-12}{2(23)-12-8}\times10$$
$$=120+4.23=124.23$$

½ ½ ½ ½

OR

Class	*f*	*c.f.*
0–15	17	17
15–30	35	52
30–45	40	92
45–60	18	110
60–75	m	$110 + m$
75–90	2	$112 + m$

For correct table — 1

Median class is 30–45 — ½

$$33 = 30 + \frac{15}{40}\left(\frac{112+m}{2} - 52\right)$$ — 1

$$\Rightarrow m = 8$$ — ½

Mode:

Modal class = 30-45, l= 30, h=15, $f_0 = 35, f_1 = 40, f_2 = 18,$

$$\text{Mode} = l + \frac{f_1 - f_0}{2f_1 - f_0 - f_2} h$$ — ½

$$= 30 + \frac{40 - 35}{2(40) - 35 - 18} \times 15$$ — ½

$$= 30 + \frac{5}{27} \times 15 = 30 + 2.78 = 32.78$$ — ½

Q.36.	(i) 420 = 2^2x3x7x5, 130=13x2x5 ---------- 1 m (ii) 10 ---------- 1 m (iii) a) 540= 2^2 x 3^3 x 5 ---------- 1 m HCF (420,130,540) =10 ---------- ½ m Number of stacks = 420/10+130/10+540/10= 109 stacks ---------- ½ m (iii)b) 840=2^3x3x7x5, 260 =13x2^2x5, HCF (840, 260) = 20, ---------- 1 ½ m Number of stacks= 840/20+ 260/20 =55 stacks ---------- ½ m

37.	(i) length = 7 – 2x, breadth = 12 – 2 x ---------- 1 m (ii) (7 – 2x)(12 – 2 x)= 36 $4x^2 – 38 x + 48 = 0$ ---------- 1 m (iii) a) $2x^2 – 19 x + 24 = 0$ (x-8)(2x-3)=0 X = 8(not possible) , x = 3/2 m ---------- 2 m (iii) b) $(18 - 2x)(12 - 2x) = 72.$ $210-36x-24x+4x^2-72=0$ $4x^2 – 60 x + 144 = 0$ $x^2 – 15 x + 36 = 0$ ---------- 1 ½ m x=12 not possible, x=3 ---------- ½ m
Q.38.	: (i) P(type O) = $\frac{21}{50}$ *1* (ii) No. of people with AB type blood group = 50 – (21 + 22 + 5) = 2 $\frac{1}{2}$ P(type AB) = $\frac{2}{50}$ or $\frac{1}{25}$ $\frac{1}{2}$ (iii) P(neither type A nor type B) = $\frac{21+2}{50} = \frac{23}{50}$ *1+1* **OR** (iii) P(type A or type B or type O) = $\frac{21+22+5}{50} = \frac{24}{25}$ *1+1*

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