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UIMO
Unified International Mathematics Olympiad

UNIFIED INTERNATIONAL MATHEMATICS OLYMPIAD

CLASS - 10
Question Paper Code : 4P104

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SOLUTIONS

MATHEMATICS - 1 (MCQ)

01. (A) If a circle inscribed in a quadrilateral then sum of opposite angles made at the centre are supplimantary

$\therefore$ $115° + \angle COD = 180°$

$\angle COD = 180° - 115° = 65°$

02. (A) $210 = 5 \times 7 \times 2 \times 3$

$65 = 5 \times 13$

$\therefore$ HCF of 210 & 65 = 5

Given $199 \times 5 + 55y = 5$

$199 \times 5 - 5 = -55y$

$$\frac{\cancel{198}^{18} \times \cancel{5}}{-\cancel{55}_{11}} = y$$

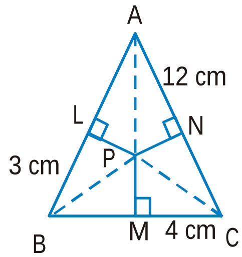
$y = -18$

$\therefore$ $y^2 = (-18)^2 = 324$

03. (C) Construction :- Join PA, PS & PC

$AL^2 + BM^2 + CN^2 = AP^2 - PL^2 + BP^2 - PM^2 + CP^2 - PN^2$

$= BP^2 - PL^2 + CP^2 - PM^2 + AP^2 - PN^2$



$= BL^2 + CM^2 + AN^2 = (3\text{ cm})^2 + (4\text{ cm})^2 + (12\text{ cm})^2$

$= 9\text{ cm}^2 + 16\text{ cm}^2 + 144\text{ cm}^2 = 169\text{ cm}^2$

04. (C) Given $\frac{1}{\cancel{2}} \times \cancel{20}^{1}$ (DE + BC) = 320 cm^2

$DE + BC = \frac{320\text{ cm}^2}{10\text{ cm}} = 32\text{ cm}$

DE = 32 – BC

$\Delta ADE \sim \Delta ACB$

[A. A. similarity]

$\frac{AD}{AC} = \frac{DE}{CB}$

$\frac{3\cancel{0}\text{ cm}}{5\cancel{0}\text{ cm}} = \frac{32 - BC}{BC}$

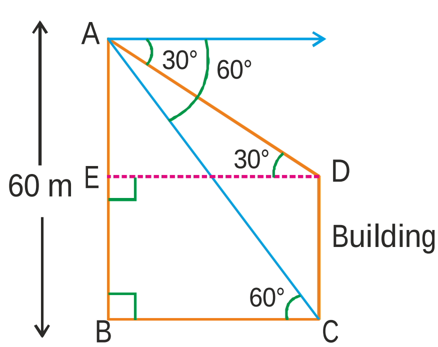
3BC = 5 × 32 = 5BC

8BC = 5 × 32

$BC = \frac{5 \times \cancel{32}^{4}}{\cancel{8}}$

= 20 cm

05. (C) In ΔABC, $\tan 60° = \frac{AB}{BC}$



$\sqrt{3} = \frac{60\text{ mts}}{BC}$

$BC = \frac{60\text{ mts}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$= 20\sqrt{3}$ mts

In ΔAED, $\tan 30° = \frac{AE}{ED}$

$\frac{1}{\sqrt{3}} = \frac{AE}{20\sqrt{3}\text{ mts}}$

[$\because$ ED = BC = $20\sqrt{3}$ m]

$\therefore$ $AE = \frac{20\cancel{\sqrt{3}}\text{ m}}{\cancel{\sqrt{3}}} = 20\text{ m}$

$\therefore$ BE = AB - AE = 40 m

$\therefore$ CD = BE = 40 m

06. (C) ABCD is a square of 7cm each side.

Area of the shaded region

$= 7 \times 7\text{cm}^2 - \frac{x}{360^o} \times \pi r^2$

$= 49\text{cm}^2 - \frac{90^o}{360^o} \times \frac{22}{7} \times 7 \times 7$

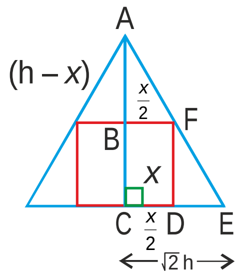
$= 49\text{cm}^2 - 38.5\text{ cm}^2 = 10.5\text{ cm}^2$

07. (A) $\frac{a_1}{a_2} = \frac{5}{3}$, $\frac{b_1}{b_2} = \frac{-15}{-9} = \frac{5}{3}$

$\frac{c1}{c2} = \frac{-8}{\left(\frac{-24}{5}\right)} = \frac{5}{3}$

$\therefore$ $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2} \Rightarrow$ coinciding lines

08. (B)



$\Delta ABF \sim \Delta ACE$ [$\because$ A - A similarity]

$\therefore \dfrac{AB}{AC} = \dfrac{BF}{CE}$

$$\frac{(h-x)}{\cancel{h}} = \frac{\left(\frac{x}{2}\right)}{\sqrt{2}\,\cancel{h}}$$

$2\sqrt{2}\,(h-x) = x$

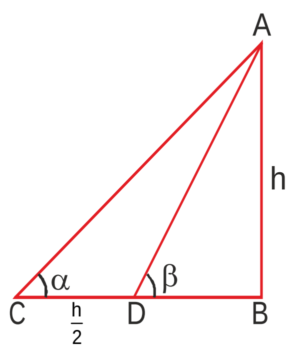
$2\sqrt{2} - 2\sqrt{2}x = x$

$2\sqrt{2}h = x(2\sqrt{2}+1)$

$$x = \frac{2\sqrt{2}h}{(2\sqrt{2}+1)}$$

$\therefore$ Volume of the cube = $\left[\dfrac{2\sqrt{2}}{(2\sqrt{2}+1)}h\right]^3$

09. (A)



In ΔABC, $\cot\alpha = \dfrac{\frac{h}{2}+BD}{h}$

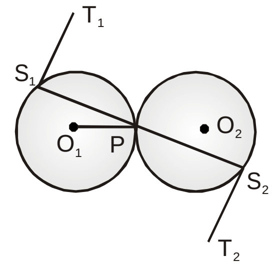
In ΔABD, $\cot\beta = \dfrac{BD}{h}$

$\cot\alpha - \cot\beta = \dfrac{h_2 + BD}{h} - \dfrac{BD}{h}$

$= \dfrac{\frac{h}{2} + \cancel{BD} - \cancel{BD}}{h} = \dfrac{h}{2} \times \dfrac{1}{h} = \dfrac{1}{2}$

10. (C) In the given figure O_1S_1 is joined

$\Rightarrow O_1S_1 \perp S_1T_1 \Rightarrow \angle O_1S_1T_1 = 90^\circ$



Again, $O_1P = O_1S_1$

$\Rightarrow \angle O_1S_1P = \angle O_1PS_1 = 20^\circ$

$\Rightarrow \angle T_1S_1P = \angle O_1S_1T_1 - \angle O_1S_1P$

$= 90^\circ - 20^\circ = 70^\circ$

$S_1T_1 \,||\, S_2T_2$

[Two circles touch externally, and through the point of contact a straight line is drawn, terminated by the circumference, then the tangents at its extremities are parallel]

$\Rightarrow \angle PS_2T_2 = \angle T_1S_1P = 70^\circ$

(alternate angle)

Hence, $\angle PS_2T_2$ measures 70°.

11. (B) $1 + 2 + 4 + 5 + 7 + 8 + 10 + ... + 97 + 98 + 100 = (1 + 2 + 4 + 5 + 7 + 8 + 10 + ... + 97 + 98 + 100) + (3 + 6 + 9 + ... + 99) - (3 + 6 + 9 + ... + 99)$

$= (1 + 2 + 3 + 4 + 5 + 6 + 7 + ... + 99 + 100) - (3 + 6 + 9 + ... + 99)$

$= \dfrac{100 \times 101}{2} - 3(1 + 2 + 3 + ... + 33)$

$= 5050 - \dfrac{3 \times 33 \times 34}{2}$

$= 5050 - 1683 = 3367$

12. (B) $AC^2 = AB^2 + BC^2$

$\therefore AC = 10$ cm

$S = \dfrac{a+b+c}{2} = \dfrac{24\text{cm}}{2} = 12$ cm

$\dfrac{1}{2} \times 6$ cm $\times 8$ cm $= rs$

$\dfrac{24\text{ cm}^2}{12\text{ cm}} = r \Rightarrow r = 2$ cm

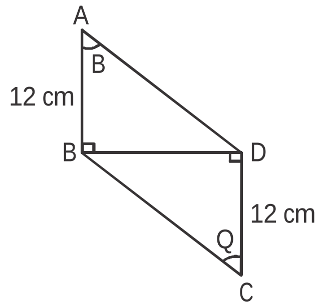
$= \dfrac{1}{2} \times 6 \times 8\text{cm}^2 - \dfrac{22}{7} \times 2 \times 2\text{ cm}^2$

$= 24\text{ cm}^2 - 12.57\text{ cm}^2 = 11.43\text{ cm}^2$

13. (C) $a = 1, \quad b = 0, \quad c = -27$

$$\alpha + \beta = -\frac{b}{a} = 0$$

14. (D)



Given tan $\tan\beta = \frac{3}{4}$

In $\Delta ABD \tan\beta = \frac{BD}{AB} = \frac{BD}{12\text{ cm}}$

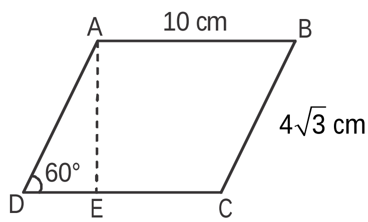
$\therefore \frac{BD}{12\text{ cm}} = \frac{3}{4} \Rightarrow BD = 9\text{ cm}$

In ΔBCD ; $\angle BDC = 90 \Rightarrow CD^2 = BC^2 - BD^2$

$CD = 12$ cm

$$\cos\theta = \frac{CD}{BC} = \frac{12\text{ cm}}{15\text{ cm}} = \frac{4}{5}$$

15. (D)



$AD = BC = 4\sqrt{3}$ cm

In $\Delta ADE, \angle E = 90° \Rightarrow \sin 60° = \frac{AE}{AD}$

$$\frac{\sqrt{3}}{2} = \frac{AE}{4\sqrt{3}\text{ cm}}$$

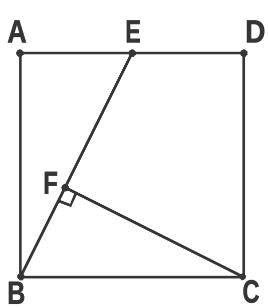
$AE = 6$ cm

Area of parallelogram ABCD = AE × CD

= 6 cm × 10 cm

= 60 cm^2

16. (C)



Since $\angle EBA = \angle FCB$ and $\angle FBC = \angle AEB$, we have

$\Delta ABE \sim \Delta FCB$. $\frac{AB}{FC} = \frac{BE}{CB} = \frac{EA}{BF}$,

$$\frac{2}{FC} = \frac{\sqrt{5}}{2} = \frac{1}{BF}$$

From those two equations, we find that $CF = \frac{4}{\sqrt{5}}$ and $BF = \frac{2}{\sqrt{5}}$. Now rthat we have BF and CF, we can find the area of the bottom triangle ΔCFB:

$$\frac{1}{2}.\frac{4}{\sqrt{5}}.\frac{2}{\sqrt{5}} = \frac{4}{5}.$$

The area of left triangle ΔBEA is $\frac{1}{2}.2.1 = 1$. The area of the square is 4.

Thus, the area of the remaining quadrilateral is $4 - 1 - \frac{4}{5} = \frac{11}{5}$, and the answer is C.

17. (B) Let the three terms of am AP be a – d, a, a + d

Given a – d + a + a + d = $\sqrt{567}$

$3a = 9\sqrt{7}$

$a = 3\sqrt{7}$

Given $(3\sqrt{7} - d)(3\sqrt{7})(3\sqrt{7} + d) = 168\sqrt{7}$

$$(3\sqrt{7} - d)(3\sqrt{7} + d) = \frac{168\sqrt{7}}{3\sqrt{7}} = 56$$

$63 - d^2 = 56 \Rightarrow 63 - 56 = d^2$

$d = \pm\sqrt{7}$

If $d = \sqrt{7}, a = 3\sqrt{7}$ then $a - d = 3\sqrt{7} - \sqrt{7} = 2\sqrt{7}$

$a = 3\sqrt{7}$

$a + d = 4\sqrt{7}$

$d = -\sqrt{7}$ $a = 3\sqrt{7}$ then $a - d = 3\sqrt{7} - (-\sqrt{7}) = 4\sqrt{7}$

$a + d = 3\sqrt{7} + (-\sqrt{7}) = 2\sqrt{7} = \sqrt{28}$

18. (D) Distance from origin for $\left(\frac{13}{2}, 0\right)$

$$= \sqrt{\left(\frac{13}{2}\right)^2 - 0^2} = \frac{13}{2}$$

Distance from origin to $\left(-6, \frac{5}{2}\right)$

$$= \sqrt{\frac{25}{4} + 36} = \frac{13}{2}$$

∴ The point in option (D) lies on the circle.

19. (A) Given sin θ + cos θ = $\sqrt{3}$

Squaring on both sides

$\sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta = 3$

∴ 1 + 2 sin θ cos θ = 3

2 sin θ cos θ = 3 – 1

$$\therefore \sin\theta\cos\theta = \frac{1}{1} = 1$$

$$\tan\theta + \cot\theta = \frac{\sin\theta}{\cos\theta} + \frac{\cos\theta}{\sin\theta}$$

$$= \frac{\sin^2\theta + \cos^2\theta}{\sin\theta\cos\theta} = \frac{1}{1} = 1$$

20. (B) Given $S_{20} = \frac{\cancel{20}^{10}}{\cancel{2}_1}[2a + 19d] = 40$

2a + 19d = 4 ..... (1)

Given $S_{40} = \frac{\cancel{40}^{\cancel{20}}}{\cancel{2}_1}[2a + 39d] = \cancel{20}^1$

2a + 39d = 1 ...... (2)

eq (2) – (1) ⇒ 20d = – 3

$$d = -\frac{3}{20}$$

$2a - \frac{57}{20} = 4$ ..... (1)

$$2a = 4 + \frac{57}{20} = \frac{137}{20} \Rightarrow a = \frac{137}{40}$$

$$S_{60} = \frac{60}{2}[2a + 59d]$$

$$= 30\left[\frac{137}{20} - \frac{177}{20}\right] = 30\left[-\frac{40}{20}\right]$$

S_{60} = – 60

21. (C) Let speed of the boat in still water be '*x*' and speed of the stream be '*y*'

Given $\frac{100}{x+y} + \frac{30}{x-y} = 6$ hours

Let $\frac{1}{x+y} = a$ and $\frac{1}{x-7} = 6$

100a + 30b = 6 ..... (1)

Given $\frac{75}{x+y} + \frac{75}{x-y} = 8$

75a + 75b = 8 ..... (2)

Eq (1) × 3 ⇒ $\cancel{300a} + 90b = 18$

Eq (2) × 4 ⇒ $\cancel{300a} + 300b = 32$

(–) (–) (–)

+210b = +14

$$b = \frac{\cancel{14}^{\cancel{2}^1}}{\cancel{210}_{\cancel{30}_{15}}}$$

$$100a + \cancel{30}^2 \times \frac{1}{\cancel{15}} = 6$$

100a = 4

$$a = \frac{4}{100} = \frac{1}{25}$$

∴ a = *x* + *y* = 25 ..... (3)

∴ b = *x* – *y* = 15 ..... (4)

eq (3) + (4) 2*x* = 40

x = 20 kmph

22. (A) Given cos θ = 1 – cos² θ = sin² θ

∴ $\sin^{12}\theta + 3\sin^{10}\theta + 3\sin^8\theta + \sin^6\theta = (\sin^4\theta)^3 + 3\sin^8\theta\sin^2\theta + 3\sin^4\theta\sin^4\theta + (\sin^2\theta)^3$

$= (\sin^4\theta + \sin^2\theta)^3$

$= (\cos^2\theta + \cos\theta)^3$

$= 1^3 = 1$

23. (D) Area of the path = $\frac{3}{\not 5_{1}} \times 100 \times 60^{12}\ m^2$

$= 3600\ m^2$

Let width of the path be x metres

$\therefore$ Total area = $(100 + 2x)(60 + 2x)$

$= 6000 + 3600$

$\Rightarrow$ $6000 + 200x + 120x + 4x^2 = 9600$

$4x^2 + 320x = 3600$

$x^2 + 80x = \frac{\not{3600}}{\not 4}900$

$x^2 + 90x - 10x - 900 = 0$

$x(x + 90) - 10(x + 90) = 0$

$\therefore$ $x = -90$ (or) $x = 10$

$\therefore$ Width of the path = $(x) = 10$ m

24. (A) The given equations are

$$\frac{1}{2(2x+3y)} + \frac{12}{7(3x-2y)} = \frac{1}{2} \quad ....(i)$$

$$\frac{7}{(2x+3y)} + \frac{4}{(3x-2y)} = 2 \quad ....(ii)$$

Putting $\frac{1}{(2x+3y)} = u$ and $\frac{1}{(3x-2y)} = v$, the given equations become

$\frac{u}{2} + \frac{12v}{7} = \frac{1}{2} \Rightarrow 7u + 24v = 7$ ....(iii)

and, $7u + 4v = 2$ ....(iv)

On subtracting (iv) from (iii), we get

$20v = 5 \Rightarrow v = \frac{5}{20} = \frac{1}{4}$

$\Rightarrow \frac{1}{(3x-2y)} = \frac{1}{4} \quad \left[\because v = \frac{1}{(3x-2y)}\right]$

$\Rightarrow 3x - 2y = 4$ ....(v)

Putting $v = \frac{1}{4}$ in (iii), we get

$7u + 24 \times \frac{1}{4} = 7 \Rightarrow 7u = (7 - 6) = 1 \Rightarrow u = \frac{1}{7}$

$\Rightarrow \frac{1}{(2x+3y)} = \frac{1}{7} \quad \left[\because u = \frac{1}{(2x+3y)}\right]$

$\Rightarrow 2x + 3y = 7$ ....(vi)

Multiplying (v) by 3, (vi) by 2 and adding the results, we get $13x = 26 \Rightarrow x = 2$

25. (C) Side of square = HCF of length and breadth of the room.

1763 cm & 1927 cm

HCF = 41 cm

1783) 1927 (1
1763
164) 1763 (10
1640
123) 164 (1
123
41) 123 (3
123
0

$\therefore$ Least number of square tiles =

$$\frac{\not{1763}^{43}\ cm \times \not{1927}^{47}\ cm}{\not{41}_1\ cm \times \not{41}_1\ cm}$$

= 2021

26. (A) Given LCM + ~~HCF~~ = 1,94,292______ (1)

LCM – ~~HCF~~ = 1,93,788_______ (2)

(–) (–)

2 LCM = 388080

LCM = $\frac{388080}{2}$ = 1,94,040

1,94,040 + HCF = 1,94,292

HCF = 1,94,292 – 1,94,040

= 252

But product of two numbers

= LCM × HCF

$2520 \times x = 194040 \times 252$

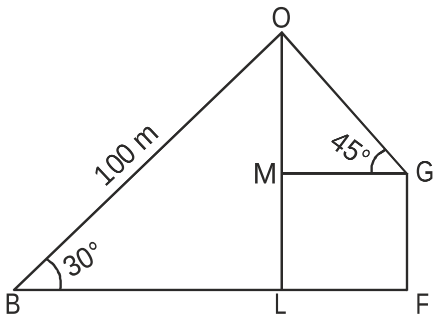
$x = \frac{194040 \times 252}{2520} = 19404$

27. (B) Let O be the position of the bird, B be the position of the boy and FG be the building at which G is the position of the girl

Let OL , BF and GM, OL

Then, BO = 100 m, $\angle OBL = 30°$,

FG = 20 m and $\angle OGM = 45°$.



From right ΔOLB, we have

$$\frac{OL}{BO} = \sin 30° \Rightarrow \frac{OL}{100\text{ m}} = \frac{1}{2}$$

$$\Rightarrow OL = 100\text{ m} \times \frac{1}{2} = 50\text{ m.}$$

OM = OL – ML = OL – FG

= 50 m – 20 m = 30 m

From right ΔOMG, we have

$$\frac{OM}{OG} = \sin 45° = \frac{1}{\sqrt{2}}$$

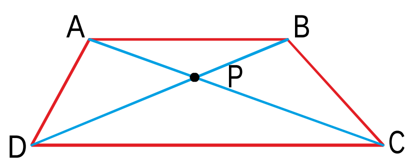
$\Rightarrow$ OG = $\sqrt{2}$ × OM = $\sqrt{2}$ × 30 m

$\Rightarrow$ OG = 30 × 1.41 m = 42.3 m.

Distance of the bird from the girl = 42.3 m

28. (B) $\Delta APB \sim \Delta CPD$ [$\because$ A – A similarity]

$\therefore$ $\frac{AP}{CP} = \frac{PB}{PD}$



$$\frac{4}{4(x-1)} = \frac{2x-1}{(2x+4)}$$

$2x + 4 = (2x – 1)(x – 1)$

$2x + 4 = 2x^2 – 2x – x + 1$

$2x^2 – 5x – 3 = 0$

$2x^2 – 6x + x – 3 = 0$

$2x(x – 3) + 1(x – 3) = 0$

$(x – 3)(2x + 1) = 0$

$\therefore x = 3$ or $x = \frac{-1}{2}$

29. (D) $x^6 – 3x^4 + 3x^2 – 1$

$= (x^2)^3 – 3(x^2)^2 + 3(x^2)(1) – 1^3$

$= (x^2 – 1)^3 = (x + 1)^3 (x – 1)^3$

$x^3 + 3x^2 + 3x + 1 = (x + 1)^3$

$\therefore$ HCF = $(x + 1)^3$

30. (D) $3748x + 5467y = 10085$

$1731x + 7484y = 4034$

(–) (–) (–)

$2017x – 2017y = 6051$

$2017(x – y) = 6051$

$$x - y = \frac{6051}{2017} = 3$$

MATHEMATICS - 2 (MAQ)

31. (A,B) $a = 5,\ b = -2\sqrt{6}\ \ c = -2$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{-(-2\sqrt{6} \pm \sqrt{(-2\sqrt{6})^2 - 4 \times 5 \times -2}}{2(5)}$$

$$= \frac{2\sqrt{6} \pm \sqrt{24 + 40}}{10}$$

$$= \frac{2\sqrt{6} \pm 8}{10} = \frac{2(\sqrt{6} \pm 4)}{10}$$

$$= \frac{4 + \sqrt{6}}{5} \text{ (OR) } \frac{-4 + \sqrt{6}}{5}$$

32. (A,B,D)

Option (A)

$$p(x) = 0.\bar{3}\,x^2 + x - 3.\bar{3}$$

$$= \left(\frac{1}{3}x^2 + x - \frac{10}{3}\right)$$

$$p(x) = \frac{1}{3}(x^2 + 3x - 10)$$

$$p(-5) = \frac{1}{3}\left[(-5)^2 + 3(-5) - 10\right]$$

$$= \frac{1}{3}(25-5-10)$$

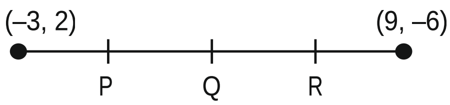
p(–5) = 0 ⇒ (–5) is zero fo p(x)

$$p(2) = \frac{1}{3}(2^2 + 3(2) - 10)$$

$$= \frac{1}{3}(4+6-10)$$

p(2) = 0 ⇒ '2' is the zero of p(x)

33. (C,D)



'P' divides A(–3, 2) and B(9, –6) in the ratio 1 :3

$$p = \left(\frac{1\times 9 + 3\times(-3)}{1+3}, \frac{1\times -6 + 3\times 2}{1+3}\right)$$

$$= \left(\frac{9-9}{4}, \frac{-6+6}{4}\right) = 0$$

'Q' divides AB in the ratio 2:2 i.e., 1:1

'Q' is a mid point of AB Q = $\left(\frac{-3+9}{2}, \frac{2+1-6}{2}\right)$

$$= \left(\frac{6}{2}, \frac{-4}{2}\right)$$

= (3, –2)

'R' divides AB in the ratio 3 : 1

$$R = \left(\frac{3\times 9 + 1\times(-3)}{1+3}, \frac{3\times -6 + (1\times 2)}{1+3}\right)$$

$$= \left(\frac{27-3}{4}, \frac{-18+2}{4}\right)$$

$$= \left(\frac{24}{4}, \frac{-16}{4}\right)$$

R = (6, –4)

34. (A,C) Given tan(A + B) = 1 = tan 45°

$\angle A + \angle B = 45° \longrightarrow$ (1)

Cot(A – B) = $\sqrt{3}$ = cot 30°

$\angle A - \angle B = 30° \longrightarrow$ (2)

eq. (1) + (2) $\angle A + \cancel{\angle B} + \angle A - \cancel{\angle B} = 45° + 30°$

$2\angle A = 75°$

$$\angle A = \frac{75°}{2} = \left(37\frac{1}{2}\right)^{\circ}$$

$$37\frac{1}{2}^{\circ} + \angle B = 45°$$

$$\angle B = 7\frac{1}{2}^{\circ}$$

35. (B,C)

Given 2025, 2018, 2011, ... 1864 are in AP.

a = 2025, d = $a_2 - a_1$ = 2018 – 20277 = –7

a_n = 1964

a + (n + 1)d = 1864

2025 + (n – 1) (–7) = 1864

(n – 1)(–7) = 1864 – 2025

(n – 1) = $\frac{-161}{-7}$

n = 23 + 1 = 24

'n' is even then middle terms are $\left(\frac{n}{2}\right)^{th}$ term and $\left(\frac{n}{2}+1\right)^{th}$ term.

∴ a_{12} = a + 11d = 2025 + 11(–7)

= 2025 – 77 = 1948

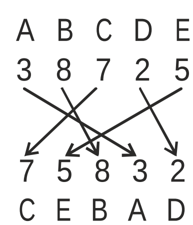
$a_{13} = a_{12}$ + d = 1948 + (–7)

= 1948 – 7 = 1941

∴ The middle terms are 1941 & 1948

REASONING

36. (D) 42198

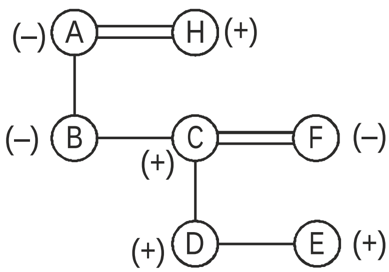


Similarly

A	B	C	D	E
9	1	4	8	2
C	E	B	A	D
4	2	1	9	8

37. (D) F = jagged inner line, G = straight inner line. M = one black dot, N = two black dots. X = six big rectangles, Y = five big rectangles.

38. (D) In this question, first we will drew the generations tree:



'═══' represent wife and husband

'———' represent brother and sister

'|' represent children

(–) represents female, (+) represents male

So, A is grand mother to E.

39. (D) All the others contain three consecutive digits.

40. (C) Looking into the alphabets there are five such pairs namely ON, HONE, ST, TRAPHO, RAP.

1. ON - NO
2. HONE - EFGH
3. ST - ST
4. TRAPHO - OPQRST
5. RAP - PQR

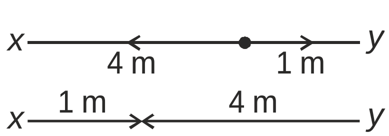
41. (D) adb_ac_da_cddcb_dbc_cbda

Fill in the missing letter out of a, b, c, d and the pattern will be as follows: adbc/acbd/abcd/dcba/dbca/cbda

So, the missing letters are cbbaa.

42. (B) 

So, the correct number of the car is 5 6 7 9 S L 1 R B

43. (D) 

44. (C) The different symbols used by the mathematician to denote the operations are

> ⟶ '+'   < ⟶ '–'

\+ ⟶ '÷'   ^ ⟶ 'x'

– ⟶ '='   x ⟶ '>'

= ⟶ '<'

Now, consider

8 < 4 + 2 = 6 > 3

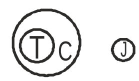
8 – 4 ÷ 2 < 6 + 3

= 6 < 9 (true)

Hence, option (C) follows the symbols correctly.

45. (B) All thieves are criminals.

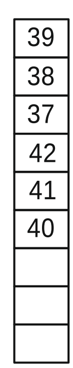
Judges are different from thieves and criminals.



Option (B) is correct.

CRITICAL THINKING

46. (A) Let Bob take block n then the blocks you will take along with it will be n-1 and n-2. This means n divisible by 3. So. Lets try to find a number between 39 and 40 that is divisible by 3. So, according to this structure bob will taking blocks 39,38 & 37 all at once. Avvording to the given picture next numbers are 3 less than original number means 36,35,&34, but we don't need to know what is after this is because 36 is not what we need to know. So, lets going backward than as we can see this 90 is five more than 85 . 5 more than previous number would be 42 and this means 41 and 40 those would be the blocks underneath it. So now we have between 40 and 39 is 4 Blocks.



47. (C) Conclusion (I) : This conclusion states that religion mandates all followers to visit Mansarovar every year.

The statement only mentions that thousands of pilgrims make the journey every year. It does not state that all followers are mandated to make the pilgrimage annually.

Therefore, Conclusion (I) does not necessarily follow from the statement.

Conclusion (II) : This conclusion states that visiting Mansarovar is an essential requirement for the salvation of all followers.

The statement does not provide information about the religious significance of the pilgrimage or whether it is essential for salvation.

Therefore, Conclusion (II) does not follow from the statement.

Conclusion : Neither Conclusion (I) nor Conclusion (II) logically follows from the given statement.

48. (B)

(A) Tharun would be better off taking the bus to work. This option suggests an alternative to the train. While it may be a logical suggestion, the given information does not indicate whether taking the bus would improve Tharun's situation or if it is even a feasible option.

(B) Tharun's commute is less comfortable since the train schedule changed. This option directly addresses the change in Tharun's experience due to the new train schedule. It explicitly states that Tharun's commute is now less comfortable, which aligns perfectly with the information provided.

(C) Many commuters will complain about the new train schedule.

This option suggests a possible reaction from other commuters. While it is likely that other commuters are also affected, the statement focuses on Tharun's situation specifically and does not provide information about others' reactions.

(D) Tharun will likely look for a new job closer to home.

This option suggests a significant change in Tharun's life as a consequence of the train schedule change. However, the given information does not indicate that Tharun is considering such a drastic step.

Conclusion : The choice that best suggests Tharun's situation based on the provided information is:

(B) Tharun's commute is less comfortable since the train schedule changed.

This option directly reflects the impact of the new train schedule on Tharun's commute, making it the most relevant and accurate suggestion based on the given details.

49. (C) The middle of the bridge would undergo the most deflection because it is furthest away from the towers and pillars supporting the bridge. Imagine a piece of string held at either end over a gap between two tables. The point right in the middle would drop the most.

50. (B)