

3. LINEAR EQUATIONS IN ONE VARIABLE 2025/26 Class: VIII, MATHEMATICS INTEGRATED⁺ SOLUTIONS

TEACHING TASK JEE MAINS LEVEL

01. $6(3x+2) - 5(6x-1) = 6(x-3) - 5(7x-6) + 12x$
option verification technique.

D) $x = -1$

$$\begin{aligned} \text{LHS} &= 6(3(-1) + 2) - 5(6(-1) - 1) \\ &= 6(-1) - 5(-7) = -6 + 35 = 29 \end{aligned}$$

$$\begin{aligned} \text{RHS} &= 6(x-3) - 5(7x-6) + 12x \\ &= 6(-1-3) - 5(-7-6) - 12 \end{aligned}$$

$$= -24 + 65 - 12 = 29. \quad \therefore \text{LHS} = \text{RHS}$$

Ans. D

02. $0.3y + 0.4 = 0.28y + 1.16$

$$\Rightarrow \cancel{0.28y} - 0.3y = 0.4 - 1.16$$

$$\Rightarrow 0.3y - 0.28y = 1.16 - 0.4$$

$$\Rightarrow 0.02y = 0.76$$

$$\Rightarrow y = 38$$

Ans. B

03. $\frac{(x+2)(2x-3) - 2x^2 + 6}{x-5} = 2$

$$x = 10$$

$$\Rightarrow \frac{2x^2 - 3x + 4x - 6 - 2x^2 + 6}{x-5} = 2x - 10$$

Ans. C

04

$$\frac{2}{5x} - \frac{5}{3x} = \frac{1}{15}$$

$$x = -19$$

(2)

$$= \frac{6-25}{15x} = \frac{1}{15}$$

Ans: A

05

Option verification.

$$\text{let } x = 4$$

$$\text{LHS} = \frac{17-12}{5} - \frac{16+2}{3}$$

$$= 1 - 6$$

$$= -5$$

$$\text{RHS} = 5 - 24 + \frac{28+14}{3}$$

$$= -19 + 14$$

$$= -5$$

Ans: B

06

let the number be x

$$\text{Given } \frac{3}{4}x = \frac{x}{3} + 60$$

$$\Rightarrow 9x = 4x + 720$$

$$x = 144$$

Ans: C

07

let the total No. of votes be x .

$$\text{Elected person got} = 62\% = \frac{62x}{100}$$

$$\text{Looser got} = 38\% = \frac{38x}{100}$$

$$\therefore \frac{62x}{100} - \frac{38x}{100} = 144$$

$$\Rightarrow x = 600$$

Ans: B

08

let the number be x

$$\text{Given } \frac{75x}{100} + 75 = x \Rightarrow x = 300$$

Ans: B

09

let the number be x

$$\therefore 2x - \frac{7}{3} + x = \frac{3}{7} \Rightarrow x = \frac{107}{21}$$

Ans: C

10. let the two integers be x and y ($x > y$) (3)

$$\therefore x - y = 36 \rightarrow (1)$$

$$\text{and } \frac{x}{y} = 4 \rightarrow (2)$$

$$\Rightarrow x = 4y$$

$$\therefore 4y - y = 36$$

$$\Rightarrow 3y = 36$$

$$\Rightarrow y = 12 \quad \therefore x = 4 \times 12 = 48$$

Ans: C

11.

let the age of B be x years

$$\therefore \text{A's Age} = 2x$$

Three years ago.

$$\therefore 2x - 3 = 3(x - 3)$$

$$\therefore x = 6$$

$$\therefore \text{B's Age} = 6 \text{ years}$$

$$\text{A's Age} = 12 \text{ years}$$

$$\text{Total} = 18 \text{ years}$$

Ans: B

12. let x lit = 50% acid

y lit = 25% acid

$$\therefore x + y = 10 \text{ lit} \rightarrow (1)$$

$$50\% \text{ of } x + 25\% \text{ of } y = 40\% \text{ of } 10$$

$$\Rightarrow \frac{50}{100}x + \frac{25}{100}y = \frac{40}{100} \times 10$$

$$\Rightarrow 10x + 5y = 80 \rightarrow (2)$$

$$\text{solving (1) \& (2)} \Rightarrow x = 6, y = 4$$

Ans: A, B

13. Statement I: $\frac{3}{x+8} = \frac{4}{6-x}$ (4)

$$\Rightarrow 18 - 3x = 4x + 32$$

$$\Rightarrow 7x = 50 \Rightarrow x = \frac{50}{7} = \frac{-10}{2}$$

$$\Rightarrow x = -\frac{100}{7}$$

Statement II: Conceptual (True)

Ans: —

14. Statement I: Let the present age be x

Given $x + 12 = 3(x - 4)$

$\Rightarrow x = 12$ (True)

Statement II: Conceptual (True)

Ans: A

15. $\frac{2x-1}{x+3} + \frac{1-2x}{x-3} = \frac{4-3x}{x^2-9}$

$\Rightarrow (2x-1)(x-3) + (1-2x)(x+3) = 4-3x$

$= 2x^2 - 6x - x + 3 + x + 3 - 2x^2 - 6x = 4 - 3x$

$\Rightarrow x = \frac{2}{9}$

Ans: C

16. Option Verification, let $x = 1$

LHS = $\frac{6+13-4}{2+5} = \frac{15}{7}$

RHS = $\frac{12+5-2}{4+3} = \frac{15}{7}$

Ans: D

17. $5(y+6) + 4(y-3) = 20 \times \frac{5y-4}{8}$

$\Rightarrow y = 8$

Ans: B

18 Let $x = -3$

(5)

$$LHS = 2 + \frac{-6-3}{-6+3} = 2 + 3 = 5$$

$$RHS = \frac{-9+4}{-3+2} = 5$$

Ans: B

19 Let the two digit number be xy

Given $x + y = 15 \rightarrow (1)$

Also, $xy = yx + 27$

$$\Rightarrow 10x + y = 10y + x + 27 \rightarrow (2)$$

Solving (1), (2) $x = 9, y = 6$

$\therefore$ Required no = 96

Ans: 96

20 $x:y = 1:3 \Rightarrow y = 3x$ ($y > x$)

$$\therefore y - x = 50 \Rightarrow 3x - x = 50 \Rightarrow x = 25$$

$$\therefore y = 75$$

$$\therefore x + y = 100$$

Ans: 100

21 a) $x = -10$ (t) | c) $x = \frac{7}{12}$ (s)

b) $x = \frac{5}{2}$ (p) | d) $x = (q)$

Ans: t, p, s, q

22 a) $x - \frac{2}{3}x = 20 \Rightarrow x = 60$

b) $\frac{4x}{5} = \frac{2x}{3} + 10 \Rightarrow x = 75$

c) $2x = 45 + \frac{x}{2} \Rightarrow x = 30$

d) $\frac{x}{5} + 5 = \frac{x}{4} - 5 \Rightarrow x = 200$

Ans: s, x, p, q

LEARNERS TASK (CUES)

6

01. Conceptual

Ans: D

02. $ax + b = 0$

Ans: B

03. $px + q = 0$

Ans: A

04. Conceptual

Ans: C

05. x

Ans: B

06. x

Ans: B

07. 3

Ans: B

08. All the equations satisfied by $x=2$

Ans: D

09. Conceptual

Ans: C

10. x

Ans: A

JEE MAINS LEVEL

01. $3 + 7x = 17 \Rightarrow x = 2$

Ans: B

02. $-0.3K + 2.1 = 0.4K$
 $\Rightarrow 0.7K = 2.1 \Rightarrow K = 3$

Ans: B

03. $K - 12 = 24 - 3K \Rightarrow K = 9$

Ans: D

04. $-30P - 45 = 6P + 27 \Rightarrow P = -2$

Ans: B

05. $\frac{m}{5} + 8 = 4 - 3m \Rightarrow m = -\frac{5}{4}$

Ans: D

$$06 \quad \frac{5x}{6} = 80 \Rightarrow x = 96$$

Ans: A ①

$$07 \quad p + (-5) = 7 \Rightarrow p = 12$$

$$\Rightarrow 3p = 36$$

Ans: C

$$08 \quad x + (x+2) + (x+4) + (x+6) = 40$$

$$\Rightarrow x = 7$$

Ans: A

$$\boxed{09} \quad \frac{2(3y-4)}{3y-(4+5y)} = \frac{3}{5} \quad \Bigg| \quad \Rightarrow y = \frac{7}{9}$$

$$= \frac{6y-8}{-2y-4} = \frac{3}{5}$$

Ans: —

$$10 \quad 18 + 10 = 28 \text{ (True)}$$

$$18 - 10 = 8 \text{ (False)}$$

Ans: B

JEE ADVANCED LEVEL

11. Let Ravi's present age = x years
 $\therefore$ Raj's present age = $x+3$ years
 6 years ago, Ravi's age = $x-6$
 Raj's age = $(x+3)-6$
 $= x-3$

Given, $x-3 = 4(x-6) \Rightarrow x = 7$

$\therefore$ Ravi's present = 7 years

Raj's present = 10 years

Ans: A, D

12. Let ~~one~~ Rs. 1 Coins $\rightarrow x$
 Rs 50 paise coins $\rightarrow 3x$

Total Amount = Rs 35

⑧

$$x + \frac{1}{2}(3x) = 35$$

$$\Rightarrow x = 14$$

$\therefore$ One rupee coins $\rightarrow 14$

Rs. 50 paise coins $\rightarrow 42$

Ans. A B

13 Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans. A

14 Statement I: Conceptual (True)

Statement II: $\frac{4}{5}x + 4 = \frac{3}{4}x$ (True) Ans. A

15 Given No. of Rs. 50 notes: No. of Rs 20 notes = 3:5

Let No. of Rs 50 notes = $3x$

No. of Rs 20 notes = $5x$

Let No. of Rs. 10 notes = y

$$\therefore 3x + 5x + y = 25$$

$$\Rightarrow 8x + y = 25 \rightarrow \textcircled{1}$$

$$\text{Also, } 50 \times 3x + 20 \times 5x + 10y = 590$$

$$\Rightarrow 170x + 250 = 590 \rightarrow \textcircled{2} \text{ Ans: A}$$

$$16 \quad \frac{1}{2}(x - \frac{1}{2}) = \frac{1}{8} \Rightarrow x = \frac{3}{4}$$

Ans. D

$$17 \quad 5m - 6 = 3 + 2m \Rightarrow 3m = 9 \Rightarrow m = 3 \text{ Ans: B}$$

$$\boxed{18} \quad (2 - 7x)(4 + 5x) = (3 + 7x)(1 - 5x)$$

$$\Rightarrow 8 + 10x - 28x - 35x^2 = 3 - 15x + 7x - 35x^2$$

$$\Rightarrow x = \frac{11}{10}$$

Ans: —



$$19. \quad 3(2x-3) - 4(2x-1) = 12 \quad (9)$$

$$\Rightarrow 6x - 9 - 8x + 4 = 12$$

$$\Rightarrow -2x - 5 = 12$$

$$\Rightarrow x = -\frac{17}{2} = -\frac{17}{2} \Rightarrow K = 2 \quad \text{Ans: 2}$$

$$20 \quad 2x + 8 = 20 \Rightarrow x = 6 \quad \text{Ans: 6}$$

$$21 \quad a) \quad x = 3 \quad (x)$$

$$b) \quad x = -\frac{4}{3} \quad (s)$$

$$c) \quad x = 5 \quad (p)$$

$$d) \quad 3x + 3 + 9x - 27 = -8x + 11$$

$$\Rightarrow 20x = 35 \Rightarrow x = \frac{35}{20} = \frac{7}{4} \quad (v)$$

Ans: x, s, p, v

$$22 \quad a) \quad 3x + 165 = 1 \Rightarrow x = -\frac{164}{3} \quad (t)$$

$$b) \quad 0.9y - 0.12 = 0.5y + 0.8 \Rightarrow y = 3.8 \quad (p)$$

$$c) \quad 3m + 2m + 4 = 20 - 2m + 5 \Rightarrow m = 3 \quad (s)$$

$$d) \quad 2y + 6 + 3y + 3 = 8y - 12 + 3 \Rightarrow y = 6 \quad (v)$$

Ans: t, p, s, v

$\Rightarrow$ THE END $\Leftarrow$