

3. LINEAR EQUATIONS IN ONE VARIABLE

2025/26

Class: VIII, MATHEMATICS

FOUNDATION: SOLUTIONS

TEACHING TASK

2025/26

JEE MAINS

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

let $x = -1$

~~LHS~~ $6(-3+2) - 5(-6-1) = -6 + 35 = 29.$

RHS $= 6(x-3) - 5(7x-6) =$

$= 6(-1-3) - 5(-7-6) = -24 + 65 = 12 = 29$
 $+12(-1)$

Ans: D

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

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

$\Rightarrow -0.02y = -0.76$

$\Rightarrow y = 38$

Ans: B

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

Let $x = 10$

$$\text{LHS} = \frac{(10+2)(20-3) - 200 + 6}{5}$$

$$= \frac{12 \times 17 - 200 + 6}{5} = \frac{10}{5} = 2$$

Ans: C

04.
$$\frac{2}{5x} - \frac{5}{3x} = \frac{1}{15}$$

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

$$\Rightarrow x = -19$$

Ans: A

05. option verification Let $x = 4$

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

$$= \frac{5}{5} - \frac{18}{3} = 1 - 6 = -5$$

$$\text{RHS} = 5 - 6 \times 4 + \frac{28+14}{3}$$

$$= 5 - 24 + 14$$

$$= -5$$

$$\text{LHS} = \text{RHS}$$

Ans: B

06. let the number be x

~~$$\frac{x}{4} + 60 = \frac{x}{3}$$~~

~~$$\Rightarrow \frac{x}{3} - \frac{x}{4} = 60$$~~

~~$$\Rightarrow x = 12 \times 60 = 720.$$~~

06. let the number be x

$$\frac{3x}{4} = 60 + \frac{x}{3} \Rightarrow x = 144$$

Ans: C

07. ~~Optional verification.~~

07. winner got = 62%.

Losser got = 38%.

Difference = 24%.

24% $\rightarrow$ 144 votes

$$\text{Total No. of votes} = \frac{144}{24} \times 100 = 600$$

Ans: B

08. 75% of x + 75 = x

$$\Rightarrow \frac{3}{4}x + 75 = x$$

$$\Rightarrow x - \frac{3x}{4} = 75$$

$$\Rightarrow x = 300$$

Ans: B

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09. $2x(-\frac{7}{3}) + x = \frac{3}{7}$

$$\Rightarrow x = \frac{3}{7} + \frac{14}{3} = \frac{9+98}{21} = \frac{107}{21}$$

Ans: C

10. let $x - y = 36$ ($x > y$)

$$\frac{x}{y} = 4$$

$$\Rightarrow x = 4y$$

Now $4y - y = 36 \Rightarrow y = 12$

$$\Rightarrow x = 48$$

Ans: C

11. $\frac{2x-5}{3} = \frac{x+2}{2}$

$$\Rightarrow 4x - 10 = 3x + 6$$

$$\Rightarrow x = 16$$

Ans: 16

12. $2(x+4) = x+10$

$$\Rightarrow 2x + 8 = x + 10$$

$$\Rightarrow x = 2$$

Ans: A

13. $2(3)^2 - 5(3) + 1 = 18 - 15 + 1 = 4$

Ans: D

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(5)

01. A, B, C

02. let x lit = 50% acid

y lit = 25% acid

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

50% of x + 25% of y = 40% of 10

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

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

Solving (1) & (2) $\Rightarrow x = 6, y = 4$

Ans: A, B

03. Statement I: $F : S = 3 : 2$

$$(x+1) : (x-1) = 3 : 2$$

$$\Rightarrow 2(x+1) = 3(x-1) \quad (\text{True})$$

Statement II: True

Ans: A

04. Statement I: let the present age be x

According to given data, $x + 12 = 3(x - 4)$

$$\Rightarrow x = 12 \quad (\text{True})$$

Statement II: Conceptual (True)

Ans: A

05. Assertion: $4x-5 = 3x+6$ (6)
 $\Rightarrow 4x-3x = 6+5 \Rightarrow x=11$ (True)

Ans: A

Reason: Conceptual (True)

06. Assertion: $(x+6):(x-2) = 3:2$
 $\Rightarrow \frac{x+6}{x-2} = \frac{3}{2}$ (True)

Ans: A

Reason: Conceptual (True)

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

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

$\Rightarrow \cancel{2x^2} - 6x - x + 3 + \cancel{x} + 3 - \cancel{2x^2} - 6x = 4-3x$

$\Rightarrow -12x + 3x = 4-6$

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

Ans: C

08. Option verification. let $x=1$

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

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

LHS = RHS

Ans: D

9. Food + Transport = $300 + 200 = \text{Rs. } 500$. ①
Ans: B

10. Spending = 500, Saving = 2

$\therefore x + 500 = 1200$

Ans: A

11. Let the two digit number be xy

Given $x + y = 15 \rightarrow \textcircled{1}$

Also, $xy = yx + 27$

$\Rightarrow 10x + y = 10y + x + 27 \rightarrow \textcircled{2}$

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

$\therefore$ Required no = 96

Ans: 96

12. ~~$x : y = 1 : 3$~~
 ~~$\Rightarrow 3x = y$~~

~~$x + y = 50$~~
 ~~$x = 3x$~~

12 $x : y = 1 : 3$
 $\Rightarrow y = 3x \quad (y > x)$

$y - x = 50$

$\Rightarrow 3x - x = 50$

$\Rightarrow x = 25$

$\therefore y = 75$

$\therefore x + y = 100$

Ans: 100

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a) $2(x+2) = 3(x-1)$

b) $5(2x-3) = 4(x+1)$

c) $3(x-4) = x$

d) $5(3x+1) = 2(2x-1)$ Ans: P, Q, R, S

14

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, R, P, Q

LEARNERS TASKCUQ'S

01. Conceptual

Ans: D

02. x is a solution of $ax+b=0$

$\Rightarrow ax+b=0$

Ans: B

03 $px + q = 0$

⑨
Ans: A

*04. Every linear equation has infinite number of solutions.

Ans: C

05. x

Ans: B

06. x

Ans: B

07. Constant term = 3

Ans: B

08 (Conceptual) all equations satisfied by $x = 2$

Ans: D

09. Straight line

Ans: ~~A~~

10. x

Ans: A

11. 4

Ans: A

12. 7

Ans: C

13. Subtracting 6 on b/s

Ans: A

14. Add 5

Ans: A

15. Conceptual

Ans: C



01. $\frac{3}{7} + x = \frac{17}{7}$

Ans: B

$$\Rightarrow x = \frac{17}{7} - \frac{3}{7} = \frac{14}{7} = 2$$

02. $-0.3K + 2.1 = 0.4K$

$$\Rightarrow 0.7K = 2.1$$

Ans: C

$$\Rightarrow K = 3$$

03. $\frac{K}{3} - 4 = 8 - K$

$$\Rightarrow \frac{K}{3} + K = 8 + 4$$

Ans: D

$$\Rightarrow 4K = 36 \Rightarrow K = 9$$

04. $\Rightarrow 5(-6p - 9) = 3(2p + 9)$

$$\Rightarrow -30p - 45 = 6p + 27$$

$$\Rightarrow 36p = -72$$

Ans: B

$$\Rightarrow p = -2$$

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

Ans: D

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

Ans: A

07. $p + (-5) = 7 \Rightarrow p = 12$
 $\Rightarrow 3p = 36$

Ans: C

08

$$x + x + 2 + x + 4 + x + 6 = 40$$

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$$\Rightarrow 4x + 12 = 40$$

$$\Rightarrow x + 3 = 10$$

$$\Rightarrow x = 7$$

Ans: A

09. ~~Option Verification, let~~

$$\boxed{09.} \quad \frac{2(3y-4)}{3y-(4+5y)} = \frac{3}{5}$$

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

$$\Rightarrow 30y - 40 = -6y - 12$$

$$\Rightarrow 36y = 28$$

$$\Rightarrow y = \frac{7}{9}$$

Ans: —

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

$$18 - 10 = 8 \neq 4 \text{ (False)}$$

Ans: B

$$\boxed{11.} \quad 3(x-2) = 2(x+1)$$

$$\Rightarrow 3x - 6 = 2x + 2$$

$$\Rightarrow x = 8$$

Ans: A

$$12. \quad 4x - (3x - 5) = 9$$

$$\Rightarrow x + 5 = 9$$

$$\Rightarrow x = 4$$

Ans: C

13. No solution

Ans: B

$$14. \quad 2(2x - 3) = 4(x + 1)$$

$$\Rightarrow 4x - 6 = 4x + 4$$

$\Rightarrow$ No solution

Ans: —

$$15. \quad 2(x + 4) = 3x$$

$$\Rightarrow 2x + 8 = 3x$$

$$\Rightarrow x = 8$$

Ans: C

JEE ADVANCED

01. Let Ravi's present age = x years

$\therefore$ Raj's present age = $x + 3$ years

6 years ago, ~~$(x - 3) - 6$~~ Ravi's age = $(x - 6)$ years

Raj's age = $(x + 3) - 6$
 $= x - 3$ years

$\therefore$ According to data, $x - 3 = 4(x - 6) \Rightarrow x = 7$

$\therefore$ Ravi's present age = 7 years

Raj's present age = 10 years

Ans: A, D.

02. Let one super coins = x
 $\therefore$ fifty paise coins = $3x$.
 $\therefore$ total amount = Rs 35
 $\therefore x + \frac{1}{2}(3x) = 35$
 $\Rightarrow 5x = 70$
 $\Rightarrow x = 14$.
 $\therefore$ One super coins = 14
 fifty paise coins = 42.

Ans: A, B

03. Statement I: Conceptual (True)

Statement II: $2(2) + 3(3) - 13$
 $= 4 + 9 - 13$
 $= 0$ (True)

Ans: A

04. Statement I: Conceptual (True)

Statement II: Conceptual (True)

Ans: A

05. Assertion: Conceptual (True)

Reason: 5 and 7 are constants (False)

Ans: C

06. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: C

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

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$\therefore$ let No. of Rs. 50 notes = $3x$

No. of Rs. 20 notes = $5x$

No. of Rs. 10 notes = y

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

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

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

$$\Rightarrow 150x + 100x + 10(25 - 8x) = 590$$

$$\Rightarrow 170x + 250 = 590$$

Ans: A

08 $\frac{1}{2}\left(x - \frac{1}{2}\right) = \frac{1}{8}$

$$\Rightarrow x - \frac{1}{2} = \frac{1}{4} \Rightarrow x = \frac{3}{4}$$

Ans: D

09. Cost of each student ticket = $(x - 15)$.

Where x = cost of adult ticket

Ans: B

10. $6x + 4(x - 15) = 540$.

Ans: A

11. $3(2x - 3) - 4(2x - 1) = 12$

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

$$\Rightarrow -2x = 17$$

$$\Rightarrow x = \frac{-17}{2} = -\frac{17}{2} \Rightarrow k = 2$$

Ans: 2

12. Cost of talk time = Rs $2x$.
 SMS $\rightarrow$ are free
 $\therefore 2x = 350$
 $\Rightarrow x = 175$.

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Ans: 175

13 a) $(x+2):(x-1) = 5:3$

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

b) $\frac{60}{x} = \frac{4}{5}$

c) $\frac{2x-4}{3x+1} = \frac{2}{3}$

d) $\frac{x}{x-5} = \frac{7}{2}$

Ans: P, Q, R, S

14. a) $\frac{x}{5} + 11 = \frac{1}{15}$

$\Rightarrow 3x + 165 = 1 \Rightarrow x = \frac{-164}{3}$

b) $0.9y - 0.12 = 0.5y + 0.8 \Rightarrow y = \frac{0.92}{0.4} = 2.3$

c) $3m + 2m + 4 = 20 - 2m + 5$

$\Rightarrow 7m = 21 \Rightarrow m = 3$

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

Ans: P, S, Q

$\Rightarrow$ THE END $\Leftarrow$