

## CBSE CLASS 8 MATHEMATICS

### Linear Equations In One Variable – Chapter 2

#### Exercise 2.5

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Solve the following linear equations:

$$1. \frac{x}{2} - \frac{1}{5} = \frac{x}{3} + \frac{1}{4}$$

$$2. \frac{n}{2} - \frac{3n}{4} + \frac{5n}{6} = 21$$

$$3. x + 7 - \frac{8x}{3} = \frac{17}{6} - \frac{5x}{2}$$

$$4. \frac{x-5}{3} = \frac{x-3}{5}$$

$$5. \frac{3t-2}{4} - \frac{2t+3}{3} = \frac{2}{3} - t$$

$$6. m - \frac{m-1}{2} = 1 - \frac{m-2}{3}$$

Simplify and solve the following linear equations.

$$7. 3(t-3) = 5(2t+1)$$

$$8. 15(y-4) - 2(y-9) + 5(y+6) = 0$$

$$9. 3(5z-7) - 2(9z-11) = 4(8z-13) - 17$$

$$10. 0.25(4f-3) = 0.05(10f-9)$$

SOLUTIONS:

1. Transposing the variables to LHS and the constants to RHS.

$$\frac{x}{2} - \frac{x}{3} = \frac{1}{4} + \frac{1}{5}$$

$$\frac{3x-2x}{2 \times 3} = \frac{5+4}{5 \times 4}$$

$$\frac{x}{6} = \frac{9}{20}$$

$$20x = 9 \times 6 \text{ (by cross multiplication)}$$

$$20x = 54$$

$$x = \frac{54}{20} = \frac{27}{10}$$

$$2. \frac{6n-9n+10n}{12} = 21 \text{ (Since LCM is 12)}$$

$$\frac{7n}{12} = 21$$

$$7n = 21 \times 12$$

$$7n = 252$$

$$n = \frac{252}{7} = 36.$$

3. Transposing the variables to LHS and the constants to RHS.

$$x - \frac{8x}{3} + \frac{5x}{2} = \frac{17}{6} - 7$$

$$\frac{6x-16x+15x}{6} = \frac{17-42}{6} \text{ (Since LCM is 6)}$$

$$\frac{5x}{6} = \frac{-25}{6} \text{ (Multiply both sides by 6)}$$

$$5x = -25$$

$$x = \frac{-25}{5} = -5.$$

$$4. \frac{x-5}{3} = \frac{x-3}{5}$$

$$5(x-5) = 3(x-3) \text{ (by cross multiplication)}$$

$$5x - 25 = 3x - 9 \text{ (Opening the brackets)}$$

$$5x - 3x = -9 + 25 \text{ (Transposing)}$$

$$2x = 16$$

$$x = \frac{16}{2} = 8.$$

$$5. \frac{3t-2}{4} - \frac{2t+3}{3} + t = \frac{2}{3}$$

$$\frac{3(3t-2)-4(2t+3)+12t}{12} = \frac{2}{3} \text{ (Since LCM is 12)}$$

$$\frac{9t-6-8t-12+12t}{12} = \frac{2}{3} \text{ (Opening the brackets)}$$

$$\frac{13t-18}{12} = \frac{2}{3}$$

$$3(13t - 18) = 12 \times 2 \text{ (by cross multiplication)}$$

$$39t - 54 = 24$$

$$39t = 24 + 54 = 78$$

$$t = \frac{78}{39} = 2.$$

$$6. m - \frac{m-1}{2} + \frac{m-2}{3} = 1 \text{ (Transposing variables)}$$

$$\frac{6m-3(m-1)+2(m-2)}{6} = 1 \text{ (Since LCM is 6)}$$

$$\frac{6m-3m+3+2m-4}{6} = 1 \text{ (opening the brackets)}$$

$$\frac{5m-1}{6} = 1$$

$$5m - 1 = 6$$

$$5m = 6 + 1 = 7$$

$$m = \frac{7}{5}.$$

$$7. 3(t-3) = 5(2t+1)$$

$$3t - 9 = 10t + 5 \text{ (Opening the brackets)}$$

$$3t - 10t = 5 + 9$$

$$-7t = 14$$

$$t = \frac{14}{-7} = -2$$

$$8. 15(y-4) - 2(y-9) + 5(y+6) = 0$$

$$15y - 60 - 2y + 18 + 5y + 30 = 0 \text{ (Opening the brackets)}$$

$$18y - 12 = 0$$

$$18y = 12$$

$$y = \frac{12}{18} = \frac{2}{3}$$

$$9. 3(5z - 7) - 2(9z - 11) = 4(8z - 13) - 17$$

$$15z - 21 - 18z + 22 = 32z - 52 - 17 \text{ (opening the brackets)}$$

$$15z - 18z - 32z = -52 - 17 + 21 - 22 \text{ (Transposing constants and variables)}$$

$$-35z = -70$$

$$z = \frac{-70}{-35} = 2$$

$$10. 0.25(4f - 3) = 0.05(10f - 9)$$

$$1f - 0.75 = 0.5f - 0.45$$

$$f - 0.5f = -0.45 + 0.75$$

$$0.5f = 0.30$$

$$f = \frac{0.30}{0.5} = 0.6$$

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