

RD Sharma
Solutions

Class 7

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Exercise 8.3

Solve each of the following equations. Also, verify the result in each case.

1. $6x + 5 = 2x + 17$

Sol: Transposing $2x$ to LHS and 5 to RHS

$$\Rightarrow 6x - 2x = 17 - 5$$

$$\Rightarrow 4x = 12$$

$$\Rightarrow x = \frac{12}{4} = 3$$

Verification: putting $x=3$ in equation

$$6 \times 3 + 5 = 2 \times 3 + 17$$

$$\Rightarrow 18 + 5 = 6 + 17$$

$$\Rightarrow 23 = 23$$

Hence LHS = RHS

(ii) $2(5x - 3) - 3(2x - 1) = 9$

Solution: simplifying the brackets, we get

$$2 \times 5x - 2 \times 3 - 3 \times 2x + 3 \times 1 = 9$$

$$10x - 6 - 6x + 3 = 9$$

$$\Rightarrow 10x - 6x - 6 + 3 = 9$$

$$\Rightarrow 4x - 3 = 9$$

$$\Rightarrow 4x = 9 + 3 \quad (\text{Transposing } 3 \text{ to RHS})$$

$$\Rightarrow 4x = 12$$

$$\Rightarrow x = \frac{12}{4} = 3$$

verification: putting $x=3$ in given equation

$$2(5 \times 3 - 3) - 3(2 \times 3 - 1) = 9$$

$$\Rightarrow 2(15 - 3) - 3(6 - 1) = 9$$

$$\Rightarrow 2 \times 12 - 3 \times 5 = 9$$

$$\Rightarrow 24 - 15 = 9$$

$$\Rightarrow 9 = 9$$

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

$$\textcircled{3} \quad \frac{x}{2} = \frac{x}{3} + 1$$

Transposing $\frac{x}{3}$ to LHS

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

$$\Rightarrow \frac{3x - 2x}{6} = 1$$

$$\Rightarrow \frac{x}{6} = 1$$

$$\Rightarrow x = 6 \quad (\text{By cross multiplying})$$

Verification: putting $x=6$ in equation

$$\frac{6}{2} = \frac{6}{3} + 1$$

$$\Rightarrow 3 = 2 + 1$$

$$\Rightarrow 3 = 3$$

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

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

Transposing $\frac{2x}{5}$ to LHS and $\frac{3}{2}$ to RHS, we get

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

$$= \frac{5x - 4x}{10} = \frac{-2 - 3}{2}$$

$$\Rightarrow \frac{x}{10} = -\frac{5}{2}$$

$$\Rightarrow 2x = -10 \times 5 \quad (\text{cross multiplying})$$

$$2x = -50$$

$$x = -\frac{50}{2} = -25$$

Verification: $-\frac{25}{2} + \frac{3}{2} = \frac{2(-25)}{5} - 1$

$$\Rightarrow \frac{-25 + 3}{2} = \frac{-50 - 5}{5}$$

$$\Rightarrow \frac{-22}{2} = \frac{-55}{5} \Rightarrow -11 = -11$$

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

$$\textcircled{5} \quad \frac{3}{4}(x-1) = (x-3)$$

simplifying the brackets

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

Transposing x to LHS and $-\frac{3}{4}$ to RHS

$$\frac{3}{4}x - x = -3 + \frac{3}{4}$$

$$\Rightarrow \frac{3x - 4x}{4} = \frac{-12 + 3}{4}$$

$$\Rightarrow -\frac{x}{4} = -\frac{9}{4}$$

Multiplying by 4 both sides

$$\Rightarrow -\frac{x}{4} \times 4 = -\frac{9}{4} \times 4$$

$$\Rightarrow -x = -9$$

$$\Rightarrow x = 9$$

verification : Putting $x=9$ in the given equation.

$$\frac{3}{4}(9-1) = 9-3$$

$$\Rightarrow \frac{3}{4} \times 8 = 6$$

$$\Rightarrow \frac{24}{4} = 6$$

$$\Rightarrow 6 = 6$$

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

$$\textcircled{6} \quad 3(x-3) = 5(2x+1)$$

simplifying the brackets, we get

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

Transposing $10x$ to LHS, -9 to RHS

$$\Rightarrow 3x - 10x = 5 + 9$$

$$\Rightarrow -7x = 14$$

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

verification: putting $x = -2$ in the equation

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

$$\Rightarrow 3(-5) = 5(-3)$$

$$\Rightarrow -15 = -15$$

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

$$\textcircled{7} \quad 3x - 2(2x - 5) = 2(x + 3) - 8$$

Simplifying brackets, we get

$$3x - 4x + 10 = 2x + 6 - 8$$

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

Transposing $2x$ to LHS, 10 to RHS

$$\Rightarrow -x - 2x = -2 - 10$$

$$\Rightarrow -3x = -12$$

$$\Rightarrow x = \frac{12}{3} = 4$$

verification: putting $x = 4$ in equation

$$3(4) - 2\{2(4) - 5\} = 2(4 + 3) - 8$$

$$= 12 - 2(8 - 5) = 2(7) - 8$$

$$= 12 - 6 = 14 - 8$$

$$= 6 = 6$$

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

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

Transposing $\frac{x}{4}$ to LHS, $-\frac{1}{2}$ to RHS.

$\Rightarrow$

$\Rightarrow$

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

$$= \frac{4x - x - x}{4} = \frac{6 + 1}{2}$$

$$\Rightarrow \frac{4x - 2x}{4} = \frac{7}{2} \Rightarrow \frac{2x}{4} = \frac{7}{2}$$

$$\Rightarrow \frac{x}{2} = \frac{7}{2}$$

$$\Rightarrow x = 7$$

Verification:

$$7 - \frac{7}{4} - \frac{1}{2} = 3 + \frac{7}{4}$$

$$= \frac{28 - 7 - 2}{4} = \frac{12 + 7}{4}$$

$$\Rightarrow \frac{19}{4} = \frac{19}{4}$$

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

$$(9) \quad \frac{6x-2}{9} + \frac{3x+5}{18} = \frac{1}{3}$$

$$\Rightarrow \frac{2(6x-2) + 3x+5}{18} = \frac{1}{3}$$

$$\Rightarrow \frac{12x-4+3x+5}{18} = \frac{1}{3}$$

$$\Rightarrow \frac{15x+1}{18} = \frac{1}{3}$$

By Cross multiplying

$$\Rightarrow 3(15x+1) = 18$$

$$\Rightarrow 45x+3 = 18$$

$$\Rightarrow 45x = 18-3$$

$$\Rightarrow 45x = 15$$

$$\Rightarrow x = \frac{15}{45} = \frac{1}{3}$$

Verification: $\frac{6(\frac{1}{3})-2}{9} + \frac{3(\frac{1}{3})+5}{18} = \frac{1}{3}$

$$\Rightarrow \frac{2-2}{9} + \frac{1+5}{18} = \frac{1}{3}$$

$$\Rightarrow 0 + \frac{6}{18} = \frac{1}{3}$$

$$\Rightarrow \frac{1}{3} = \frac{1}{3}$$

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

$$(10) \quad m - \frac{(m-1)}{2} = 1 - \frac{m-2}{3}$$

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

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

By cross multiplying

$$\Rightarrow 3(m+1) = 2(5-m)$$

$$\Rightarrow 3m+3 = 10-2m$$

Transposing $-2m$ to LHS and 3 to RHS

$$\Rightarrow 3m+2m = 10-3$$

$$\Rightarrow 5m = 7$$

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

Verification: putting $m = \frac{7}{5}$ to given equation

$$\frac{7}{5} - \frac{\left(\frac{7}{5} - 1\right)}{2} = 1 - \frac{\left(\frac{7}{5} - 2\right)}{3}$$

$$= \frac{7}{5} - \frac{7-5}{5 \times 2} = 1 - \frac{7-2 \times 5}{5 \times 3}$$

$$= \frac{7}{5} - \frac{2}{10} = 1 - \frac{7-10}{15} \Rightarrow \frac{7}{5} - \frac{1}{5} = 1 + \frac{3}{15}$$

$$= \frac{7-1}{5} = \frac{15+3}{15}$$

$$\Rightarrow \frac{6}{5} = \frac{18}{15} = \frac{6}{5}$$

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

$$\textcircled{11} \quad \frac{(5x-1)}{3} - \frac{(2x-2)}{3} = 1$$

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

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

$$\Rightarrow \frac{3x+1}{3} = 1 \quad (\text{By Cross Multiplication})$$

$$\Rightarrow 3x+1=3 \quad (\text{Transposing 1 to RHS})$$

$$\Rightarrow 3x = 3-1 \Rightarrow 3x = 2$$

$$\Rightarrow x = \frac{2}{3}$$

Verification: putting $x = \frac{2}{3}$ in equation

$$\frac{\{5(\frac{2}{3})-1\}}{3} - \frac{\{2(\frac{2}{3})-2\}}{3} = 1$$

$$= \frac{(\frac{10}{3}-1)}{3} - \frac{(\frac{4}{3}-2)}{3} = 1$$

$$\Rightarrow \frac{10-3}{3 \times 3} - \frac{4-6}{3 \times 3} = 1$$

$$\Rightarrow \frac{7}{9} - \frac{-2}{9} = 1$$

$$= \frac{7+2}{9} = 1$$

$$= \frac{9}{9} = 1 \Rightarrow 1 = 1$$

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

$$\underline{12} \quad 0.6x + \frac{4}{5} = 0.28x + 1.16$$

Transposing $0.28x$ to LHS and
 $\frac{4}{5}$ to RHS

$$\Rightarrow 0.6x - 0.28x = 1.16 - \frac{4}{5}$$

$$\Rightarrow 0.32x = 1.16 - 0.8$$

$$0.32x = 0.36$$

$$\Rightarrow x = \frac{0.36}{0.32} = \frac{36}{32} = \frac{9}{8}$$

Verification: putting $x = \frac{9}{8}$ in equation

$$0.6\left(\frac{9}{8}\right) + \frac{4}{5} = 0.28\left(\frac{9}{8}\right) + 1.16$$

$$\Rightarrow \frac{5.4}{8} + \frac{4}{5} = \frac{0.63}{2} + 1.16$$

$$= 0.675 + 0.8 = 0.315 + 1.16$$

$$= 1.475 = 1.475 \Rightarrow \text{LHS} = \text{RHS}$$

$$\underline{9.13} \quad 0.5x + \frac{x}{3} = 0.25x + 7$$

$$= \frac{1.5x + x}{3} = 0.25x + 7$$

$$= 2.5x = 3(0.25x + 7)$$

By cross multiplying.

$$\Rightarrow 2.5x = 0.75x + 21$$

$$\Rightarrow 2.5x - 0.75x = 21$$

$$\Rightarrow 1.75x = 21 \Rightarrow x = \frac{21}{1.75} = 12$$

Verification : putting $x=12$ in equation

$$0.5(12) + \frac{12}{3} = 0.25(12) + 7$$

$$\Rightarrow 6 + 4 = 3 + 7$$

$$\Rightarrow 10 = 10$$

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

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