RD SHARMA

Solutions

Class 7 Maths

Chapter 8

Ex 8.3

Q1. $6x + 5 = 2x + 17$

SOLUTION :

We have

$6x + 5 = 2x + 17$

Transposing $2x$ to LHS and 5 to RHS, we get

$6x - 2x = 17 - 5$

$4x = 12$

Dividing both sides by 4, we get

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

$x = 3$

Verification :

Substituting $x = 3$ in the given equation, we get

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

$18 + 5 = 6 + 17$

$23 = 23$

LHS = RHS

Hence, verified.

Q2. $2(5x - 3) - 3(2x - 1) = 9$

SOLUTION :

We have

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

Expanding the brackets, we get

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

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

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

$4x - 3 = 9$

Adding 3 to both sides, we get

$4x - 3 + 3 = 9 + 3$

$4x = 12$

Dividing both sides by 4, we get

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

Thus, $x = 3$.

Verification :

Substituting $x = 3$ in LHS, we get

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

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

$= 24 - 15$

$= 9$

LHS = RHS

Hence, verified.

Q3 . $\frac{x}{2} = \frac{x}{3} + 1$

SOLUTION :

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

Transposing $\frac{x}{2}$ to LHS , we get

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

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

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

Multiplying both sides by 6, we get

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

$x=6$

Verification :

Substituting x = 6 in the given equation, we get

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

$3 = 2 + 1$

$3 = 3$

LHS = RHS

Hence, verified.

Q4. $\frac{x}{2} + \frac{3}{2} = \frac{2x}{5} - 1$

SOLUTION :

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

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

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

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

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

Multiplying both sides by 10, we get

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

$\Rightarrow x = -25$

Verification :

Substituting x = -25 in the given equation, we get

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

$\frac{-22}{2} = -10 - 1$

$-11 = -11$

LHS = RHS

Hence, verified.

Q5. $\frac{3}{4}(x - 1) = x - 3$

SOLUTION :

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

On expanding the brackets on both sides, we get

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

Transposing $\frac{3x}{4}$ to RHS and 3 to LHS, we get

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

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

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

Multiplying both sides by 4, we get

$\Rightarrow x = 9$

Verification :

Substituting x = 9 on both sides, we get

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

$\frac{3}{4}$ [/latex] × 8 = 6

6 = 6

LHS = RHS

Hence, verified.

Q6. 3(x – 3) = 5(2x + 1)

SOLUTION :

3(x – 3) = 5(2x + 1)

On expanding the brackets on both sides, we get

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

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

Transposing 10x to LHS and 9 to RHS, we get

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

$\Rightarrow -7x = 14$

Dividing both sides by 7, we get

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

$\Rightarrow x = -2$

Verification :

Substituting x = -2 on both sides, we get

3(-2 – 3) = 5{2(-2) +1}

3(-5) = 5(-3)

-15 = -15

LHS = RHS

Hence, verified.

Q7. 3x – 2(2x – 5) = 2(x + 3) – 8

SOLUTION :

3x – 2(2x – 5) = 2(x + 3) – 8

On expanding the brackets on both sides, we get

$\Rightarrow 3x - 2\times 2x + 2\times 5 = 2\times x + 2\times 3 - 8$

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

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

Transposing x to RHS and 2 to LHS, we get

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

$\Rightarrow 3x = 12$

Dividing both sides by 3, we get

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

$\Rightarrow x = 4$

Verification :

Substituting x = 4 on both sides, we get

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

$12 - 2(8 - 5) = 14 - 8$

$12 - 6 = 6$

$6 = 6$

LHS = RHS

Hence, verified.

Q8. $\mathbf{x - \frac{x}{4} - \frac{1}{2} = 3 + \frac{x}{4}}$

SOLUTION :

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

Transposing $\frac{x}{4}$ to LHS and $-\frac{1}{2}$ to RHS, we get

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

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

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

Multiplying both sides by 4, we get

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

$\Rightarrow 2x = 14$

Dividing both sides by 2, we get

$\Rightarrow \frac{2x}{2} = \frac{14}{2}$

$\Rightarrow x = 7$

Verification :

Substituting x = 7 on both sides, we get

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

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

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

LHS = RHS

Hence, verified.

Q9. $\mathbf{\frac{6x-2}{9} + \frac{3x+5}{18} = \frac{1}{3}}$

SOLUTION :

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

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

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

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

Multiplying both sides by 18, we get

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

$\Rightarrow 15x + 1 = 6$

Transposing 1 to RHS, we get

$\Rightarrow 15x = 6 - 1$

$\Rightarrow 15x = 5$

Dividing both sides by 15, we get

$\Rightarrow \frac{15x}{15} = \frac{5}{15}$

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

Verification :

Substituting $x = \frac{1}{3}$ on both sides, we get

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

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

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

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

LHS = RHS

Hence, verified.

Q10. $\mathbf{m - \frac{m-1}{2} = 1 - \frac{m-2}{3}}$

SOLUTION :

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

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

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

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

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

Transposing $\frac{m}{3}$ to LHS and 1/2 to RHS, we get

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

$\Rightarrow \frac{3m+2m}{6} = \frac{10-3}{6}$

Multiplying both sides by 6, we get

$\Rightarrow \frac{5m}{6} \times 6 = \frac{7}{6} \times 6$

$\Rightarrow 5m = 7$

Dividing both sides by 5, we get

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

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

Verification :

Substituting $m = \frac{7}{5}$ on both sides, we get

$\frac{7}{5} -$ Missing close brace $) - 1\}\{2\}$[/latex] $= 1 -$ Missing close brace $) - 2\}\{3\}$[/latex]

$\frac{7}{5} - \frac{7-5}{10} = 1 - \frac{7-10}{15} \frac{7}{5} - \frac{2}{10} = \frac{15+3}{15} \frac{14-2}{10} = \frac{15+3}{15} \frac{12}{10} = \frac{18}{15} \frac{6}{5} = \frac{6}{5}$

LHS = RHS

Hence, verified.

Q11. $\mathbf{\frac{5x-1}{3} - \frac{2x-2}{3} = 1}$

SOLUTION :

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

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

$\frac{3x+1}{3} = 1$

Multiplying both sides by 3, we get 3

$\frac{3x+1}{3} \times 3 = 1 \times 3$

$\Rightarrow 3x + 1 = 3$

Subtracting 1 from both sides, we get

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

$\Rightarrow 3x = 2$

Dividing both sides by 3, we get

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

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

Verification:

Substituting $x = \frac{2}{3}$ in LHS, we get

Missing close brace)-1}{3}[/latex]- Missing close brace)-2}{3}[/latex] = 1

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

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

$= \frac{\frac{10-3}{3}}{3} - \frac{\frac{4-6}{3}}{3}$

$= \frac{10-3}{9} - \frac{4-6}{9}$

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

$= \frac{9}{9}$

= RHS

LHS = RHS Hence, verified.

Q12. $0.6x + \frac{4}{5} = 0.28x + 1.16$

SOLUTION :

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

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

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

$\Rightarrow 0.32x = 1.16 - 0.8$

$\Rightarrow 0.32x = 0.36$

Dividing both sides by 0.32, we get

$\Rightarrow \frac{0.32x}{0.32} = \frac{0.36}{0.32}$

$\Rightarrow x = \frac{9}{8}$

Verification:

Substituting $x = \frac{9}{8}$ on both sides, we get

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

$\frac{5.4}{8} + \frac{4}{5} = \frac{2.52}{8} + 1.16$

$0.675 + 0.8 = 0.315 + 1.16$

$1.475 = 1.475$

LHS = RHS

Hence, verified.

Q13. $0.5x + \frac{x}{3} = 0.25x + 7$

SOLUTION :

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

$\frac{5}{10}x + \frac{x}{3} = \frac{25x}{100} + 7$

$\frac{x}{2} + \frac{x}{3} = \frac{x}{4} + 7$

Transposing $\frac{x}{4}$ to LHS , we get

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

$\frac{6x+4x-3x}{12} = 7$

$\frac{7x}{12} = 7$

Multiplying both sides by 12, we get

$\frac{7x}{12} \times 12 = 7 \times 12$

$\Rightarrow 7x = 84$

Dividing both sides by 7, we get

$\Rightarrow \frac{7x}{7} = \frac{84}{7}$

$\Rightarrow x = 12$

Verification:

Substituting x = 12 on both sides, we get

$0.5(12) + (12)3 = 0.25(12) + 7$

$6 + 4 = 3 + 7$

$10 = 10$

LHS = RHS

Hence, verified.