RD Sharma Solutions Class 8 Maths Chapter 9 Ex 9.1

Question 1.

$9\frac{1}{4} = y - 1\frac{1}{3}$

Solution:

$$9\frac{1}{4} = y - 1\frac{1}{3} \Rightarrow \frac{37}{4} = y - \frac{4}{3}$$

$$\Rightarrow \frac{37}{4} + \frac{4}{3} = y - \frac{4}{3} + \frac{4}{3}$$

$$\left(\text{Adding } \frac{4}{3} \text{ to both sides}\right)$$

$$\Rightarrow y = \frac{111+16}{12} = \frac{127}{12}$$

$$= 10\frac{7}{12}$$

$$\therefore y = 10\frac{7}{12}$$

Verification :

$$\text{R.H.S.} = y - 1\frac{1}{3} = 10\frac{7}{12} - \frac{1}{3}$$

$$= \frac{127}{12} - \frac{4}{3}$$

$$= \frac{127-16}{12} = \frac{111}{12} = \frac{37}{4} \quad \text{(Dividing by 3)}$$

$$= 9\frac{1}{4} = \text{L.H.S.}$$

Question 2.

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

Solution:

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

Subtracting $\frac{2}{5}$ from both sides :

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

$$\Rightarrow \frac{5x}{3} = \frac{3}{5}$$

$\Rightarrow$ Multiplying $\frac{3}{5}$ both sides

$$\frac{5}{3}x \times \frac{3}{5} = \frac{3}{5} \times \frac{3}{5}$$

$$\Rightarrow x = \frac{9}{25}$$

Verification :

$$\text{L.H.S.} = \frac{5x}{3} + \frac{2}{5}$$

$$= \frac{5}{3} \times \frac{9}{25} + \frac{2}{5}$$

$$= \frac{3}{5} + \frac{2}{5} = \frac{3+2}{5} = \frac{5}{5}$$

$$= 1 = \text{R.H.S.}$$

Question 3.

$\frac{x}{2} + \frac{x}{3} + \frac{x}{4} = 13$

Solution:

We have $\frac{x}{2} + \frac{x}{3} + \frac{x}{4} = 13$

L.C.M. of 2, 3, 4 = 12

$\therefore \frac{x}{2} + \frac{x}{3} + \frac{x}{4} = 13$

$6x + 4x + 3x = 13 \times 12$

$\Rightarrow 13x = 156$

$\frac{13x}{13} = \frac{156}{13}$ (Dividing both sides by 13)

$\Rightarrow x = 12$

$\therefore x = 12$

Verification :

$\text{L.H.S.} = \frac{x}{2} + \frac{x}{3} + \frac{x}{4}$

$= \frac{12}{2} + \frac{12}{3} + \frac{12}{4} = 6 + 4 + 3$

$= 13 = \text{R.H.S.}$

Question 4.

$\frac{x}{2} + \frac{x}{8} = \frac{1}{8}$

Solution:

$$\frac{x}{2} + \frac{x}{8} = \frac{1}{8}$$

$$\frac{4x + x}{8} = \frac{1}{8} \qquad \text{(L.C.M. of 2, 8 = 8)}$$

$$\frac{5x}{8} = \frac{1}{8}$$

Dividing by $\frac{5}{8}$

$$\frac{5}{8}x + \frac{5}{8} = \frac{1}{8} + \frac{5}{8}$$

$$\Rightarrow \frac{5}{8}x \times \frac{8}{5} = \frac{1}{8} \times \frac{8}{5} \Rightarrow x = \frac{1}{5}$$

$$\therefore x = \frac{1}{5}$$

Verification :

$$\text{L.H.S.} = \frac{x}{2} + \frac{x}{8}$$

$$= \frac{\frac{1}{5}}{2} + \frac{\frac{1}{5}}{8} = \frac{1}{5 \times 2} + \frac{1}{5 \times 8}$$

$$= \frac{1}{10} + \frac{1}{40} = \frac{4 + 1}{40} = \frac{5}{40}$$

$$= \frac{1}{8} = \text{R.H.S.}$$

Question 5.

$\frac{2x}{3} - \frac{3x}{8} = \frac{7}{12}$

Solution:

$$\frac{2x}{3} - \frac{3x}{8} = \frac{7}{12}$$

$$= \frac{16x - 9x}{24} = \frac{7}{12} \quad \text{(L.C.M. of 3, 8 = 24)}$$

$$= \frac{7x}{24} = \frac{7}{12}$$

Dividing by $\frac{7}{24}$

$$= \frac{7x}{24} \times \frac{7}{24} = \frac{7}{12} \times \frac{7}{24}$$

$$\Rightarrow \frac{7x}{24} \times \frac{24}{7} = \frac{7}{12} \times \frac{24}{7}$$

$$\Rightarrow x = 2$$

$$\therefore x = 2$$

Verification :

$$\text{L.H.S.} = \frac{2x}{3} - \frac{3x}{8} = \frac{2 \times 2}{3} - \frac{3 \times 2}{8}$$

$$= \frac{4}{3} - \frac{6}{8}$$

$$= \frac{4}{3} - \frac{3}{4} = \frac{16 - 9}{12} = \frac{7}{12} = \text{R.H.S.}$$

Question 6.

(x + 2) (x + 3) + (x − 3) (x − 2) − 2x (x + 1) = 0

Solution:

(x + 2) (x + 3) + (x − 3) (x − 2) − 2x (x + 1) = 0

⇒ [x² + (2 + 3) x + 2 x 3] + [x² + (-3 − 2) x + (-3) (-2)] − 2x² − 2x = 0

⇒ x² + 5x + 6 + x² − 5x + 6 − 2x² − 2x = 0

⇒ x² + x² − 2x² + 5x − 5x − 2x + 6 + 6 = 0

⇒ -2x + 12 = 0

Subtracting 12 from both sides,

-2x + 12 − 12 = 0 − 12

⇒ -2x = -12

Dividing by -2,

x = 6

Verification:

L.H.S. = (x + 2) (x + 3) + (x 3) (x 2) 2x (x + 1)

= (6 + 2) (6 + 3) + (6 3) (6 2) 2 x 6 (6 + 1)

= 8 x 9 + 3 x 4 12 x 7

= 72 + 12 84

= 84 84

= 0

= R.H.S.

Question 7.

$\frac{x}{2} - \frac{4}{5} + \frac{x}{5} + \frac{3x}{10} = \frac{1}{5}$

Solution:

$$\frac{x}{2} - \frac{4}{5} + \frac{x}{5} + \frac{3x}{10} = \frac{1}{5}$$

Adding $\frac{4}{5}$ to both sides,

$$\frac{x}{2} + \frac{x}{5} + \frac{3x}{10} - \frac{4}{5} + \frac{4}{5} = \frac{1}{5} + \frac{4}{5}$$

$$\Rightarrow \frac{x}{2} + \frac{x}{5} + \frac{3x}{10} = \frac{5}{5} = 1$$

$$\frac{5x + 2x + 3x}{10} = 1$$

(L.C.M. of 2, 5, 10 = 10)

$$\frac{10x}{10} = 1 \Rightarrow x = 1$$

$\therefore x = 1$

Verification :

$$\text{L.H.S.} = \frac{x}{2} - \frac{4}{5} + \frac{x}{5} + \frac{3x}{10}$$

$$= \frac{1}{2} - \frac{4}{5} + \frac{1}{5} + \frac{3}{10}$$

$$= \frac{5 - 8 + 2 + 3}{10} = \frac{10 - 8}{10} = \frac{2}{10}$$

$$= \frac{1}{5} = \text{R.H.S.}$$

Question 8.

$\frac{7}{x} + 35 = \frac{1}{10}$

Solution:

$$\frac{7}{x} + 35 = \frac{1}{10}$$

Subtracting 35 from both sides,

$$\frac{7}{x} + 35 - 35 = \frac{1}{10} - 35$$

$$\frac{7}{x} = \frac{1-350}{10}$$

$$\Rightarrow \frac{7}{x} = \frac{-349}{10}$$

$$\Rightarrow -349 \times x = 7 \times 10$$

(By cross multiplication)

$$\Rightarrow x = \frac{7\times10}{-349} = \frac{70}{-349} = \frac{-70}{349}$$

$$\therefore x = \frac{-70}{349}$$

Verification :

$$\text{L.H.S.} = \frac{7}{x} + 35$$

$$= \frac{7}{\frac{-70}{349}} + 35 = \frac{-7\times349}{70} + 35$$

$$= \frac{-349}{10} + 35$$

$$= \frac{-349+350}{10} = \frac{1}{10} = \text{R.H.S.}$$

Question 9.

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

Solution:

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

$$= \frac{5(2x-1)-3(6x-2)}{15} = \frac{1}{3}$$

(L.C.M. of 3, 5 = 15)

$$= \frac{10x-5-18x+6}{15} = \frac{1}{3}$$

$$= \frac{-8x+1}{15} = \frac{1}{3}$$

$\Rightarrow (-8x + 1) \times 3 = 1 \times 15$

(By cross multiplication)

$\Rightarrow$ Dividing by 3

$$\frac{(-8x+1)\times 3}{3} = \frac{1\times 15}{3} \Rightarrow -8x + 1 = 5$$

Subtracting 1 from both sides,

$-8x + 1 - 1 = 5 - 1 \Rightarrow -8x = 4$

Dividing by -8,

$$\frac{-8x}{-8} = \frac{4}{-8} \Rightarrow x = \frac{1}{-2}$$

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

Verification :

$$\text{L.H.S.} = \frac{2x-1}{3} - \frac{6x-2}{5}$$

$$= \frac{2\left(\frac{-1}{2}\right)-1}{3} - \frac{6\left(\frac{-1}{2}\right)-2}{5}$$

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

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

$$= \frac{1}{3} = \text{R.H.S.}$$

Question 10.

13 (y –4) –3 (y –9) –5 (y + 4) = 0

Solution:

13 (y – 4) – 3 (y – 9) – 5 (y + 4) = 0

⇒ 13y – 52 – 3y + 27 – 5y – 20 = 0

⇒ 13y – 3y – 5y – 52 + 27 – 20 = 0

⇒ 13y – 8y – 72 + 27 = 0

⇒ 5y – 45 = 0

Dividing by 5,

y = 9

Verification:

L.H.S. = 13 (y – 4) – 3 (y – 9) – 5 (y + 4)

= 13 (9 – 4) – 3 (9 – 9) – 5 (9 + 4)

= 13 x 5 – 3 x 0 – 5 x 13

= 65 – 0 – 65

= 0

= R.H.S.

Question 11.

$\frac{2}{3}$ (x – 5) – $\frac{1}{4}$ (x – 2) = $\frac{9}{2}$

Solution:

$$\frac{2}{3}(x-5)-\frac{1}{4}(x-2)=\frac{9}{2}$$

$$\Rightarrow \frac{2}{3}x-\frac{10}{3}-\frac{1}{4}x+\frac{1}{2}=\frac{9}{2}$$

$$\Rightarrow \frac{2}{3}x-\frac{1}{4}x-\frac{10}{3}+\frac{1}{2}=\frac{9}{2}$$

$$\frac{8x-3x-40+6=54}{12} = \frac{9}{2}$$

(L.C.M. of 3, 4, 2 = 12)

$$5x - 34 = \frac{9 \times 12}{2} = 9 \times 6 = 54$$

$5x - 34 = 54$ Adding 34 to both sides

$5x - 34 + 34 = 54 + 34$

$$\Rightarrow 5x = 88 \Rightarrow x = \frac{88}{5}$$

$$\therefore x = \frac{88}{5}$$

Verification,

$$\text{L.H.S.} = \frac{2}{3}(x-5) - \frac{1}{4}(x-2)$$

$$= \frac{2}{3}\left(\frac{88}{5} - 5\right) - \frac{1}{4}\left(\frac{88}{5} - 2\right)$$

$$= \frac{2}{3}\left(\frac{88-25}{5}\right) - \frac{1}{4}\left(\frac{88-10}{5}\right)$$

$$= \frac{2}{3} \times \frac{63}{5} - \frac{1}{4} \times \frac{78}{5}$$

$$= \frac{42}{5} - \frac{39}{10}$$

$$= \frac{84-39}{10} = \frac{45}{10} = \frac{9}{2} = \text{R.H.S.}$$