

RD SHARMA

Solutions

Class 8 Maths

Chapter 9

Ex 9.2

Solve each of the following equations and also verify your solutions:

$$\text{Q1 } \frac{2x+5}{3} = 3x - 10$$

Sol:

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

$$\Rightarrow 2x + 5 = 9x - 30$$

$$\Rightarrow 9x - 2x = 5 + 30$$

$$\Rightarrow 7x = 35$$

$$\Rightarrow x = \frac{35}{7}$$

$$\Rightarrow x = 5$$

Verification

$$\text{L.H.S} = \frac{10+5}{3}$$

$$= \frac{15}{3}$$

$$= 5$$

$$\text{R.H.S} = 15 - 10$$

$$= 5$$

Hence, L.H.S = R.H.S

$$\text{Q2 } \frac{a-8}{3} = \frac{a-3}{2}$$

Sol:

$$\frac{a-8}{3} = \frac{a-3}{2}$$

$$\Rightarrow 2a - 16 = 3a - 9$$

$$\Rightarrow 3a - 2a = 9 - 16$$

$$\Rightarrow a = -7$$

Verification

$$\text{L.H.S} = \frac{-7-8}{3}$$

$$= \frac{-15}{3}$$

$$= -5$$

$$\text{R.H.S} = \frac{-7-3}{2}$$

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

$$= -5$$

Hence, L.H.S = R.H.S

$$\text{Q3 } \frac{7y+2}{5} = \frac{6y-5}{11}$$

Sol:

$$\frac{7y+2}{5} = \frac{6y-5}{11}$$

$$\Rightarrow 77y + 22 = 30y - 25$$

$$\Rightarrow 77y - 30y = -25 - 22$$

$$\Rightarrow 47y = -47$$

$$\Rightarrow y = -1$$

Verification

$$\text{L.H.S} = \frac{-7+2}{5}$$

$$= \frac{-5}{5}$$

$$= -1$$

$$\text{R.H.S} = \frac{-6-5}{5}$$

$$= \frac{-11}{5}$$

$$= -1$$

Hence, L.H.S = R.H.S

$$\text{Q4. } x - 2x + 2 - \frac{16}{3}x + 5 = 3 - \frac{7}{2}x$$

Sol:

$$x - 2x + 2 - \frac{16}{3}x + 5 = 3 - \frac{7}{2}x$$

$$\Rightarrow \frac{3x - 6x + 6 - 16x + 15}{3} = \frac{6 - 7x}{2}$$

$$\Rightarrow \frac{-19x + 21}{3} = \frac{6 - 7x}{2}$$

$$\Rightarrow -38x + 42 = 18 - 21x$$

$$\Rightarrow 38x - 21x = 42 - 18$$

$$\Rightarrow 17x = 24$$

$$\Rightarrow x = \frac{24}{17}$$

Verification

$$\text{L.H.S} = \frac{24}{17} - 2\left(\frac{24}{17}\right) + 7 - \frac{16}{3}\left(\frac{24}{17}\right)$$

$$= \frac{-33}{17}$$

$$\text{R.H.S} = 3 - \frac{7}{2}\left(\frac{24}{17}\right)$$

$$= \frac{-33}{17}$$

Hence, L.H.S = R.H.S

$$\text{Q5. } \frac{1}{2}x + 7x - 6 = 7x + \frac{1}{4}$$

Sol:

$$\frac{1}{2}x + 7x - 6 = 7x + \frac{1}{4}$$

$$\Rightarrow \frac{1}{2}x + 7x - 7x = \frac{1}{4} + 6$$

$$\Rightarrow \frac{x}{2} = \frac{1+24}{4}$$

$$\Rightarrow \frac{x}{2} = \frac{25}{4}$$

$$\Rightarrow x = \frac{25}{2}$$

Verification

$$\text{L.H.S} = \frac{1}{2}\left(\frac{25}{2}\right) + 7\left(\frac{25}{2}\right) - 6$$

$$= \frac{351}{4}$$

$$\text{R.H.S} = \frac{351}{4}$$

Hence, L.H.S = R.H.S

$$\text{Q6. } \frac{3}{4}x + 4x = \frac{7}{8} + 6x - 6$$

Sol:

$$\frac{3}{4}x + 4x = \frac{7}{8} + 6x - 6$$

$$\Rightarrow \frac{3}{4}x - 2x = \frac{7}{8} - 6$$

$$\Rightarrow \frac{3x-8x}{4} = \frac{7-48}{8}$$

$$\Rightarrow \frac{-5x}{4} = \frac{-41}{8}$$

$$\Rightarrow -40x = -164$$

$$\Rightarrow x = \frac{164}{40}$$

$$\Rightarrow x = \frac{41}{10}$$

Verification

$$\text{L.H.S} = \frac{3}{4} \left(\frac{41}{10} \right) + 4 \left(\frac{41}{10} \right)$$

$$= \frac{123}{40} + \frac{164}{10}$$

$$= \frac{123+656}{40}$$

$$= \frac{779}{40}$$

$$\text{R.H.S} = \frac{7}{8} + 6 \left(\frac{41}{10} \right) - 6$$

$$= \frac{7}{8} + \frac{246}{10} - 6$$

$$= \frac{35+984-240}{40}$$

$$= \frac{779}{40}$$

Hence, L.H.S = R.H.S

$$\text{Q7 } \frac{7}{2}x - \frac{5}{2}x = \frac{20}{3}x + 10$$

Sol:

$$\frac{7}{2}x - \frac{5}{2}x = \frac{20}{3}x + 10$$

$$\Rightarrow \frac{7x-5x}{2} = \frac{20x+30}{3}$$

$$\Rightarrow 40x + 60 = 6x$$

$$\Rightarrow 40x - 6x = 60$$

$$\Rightarrow 34x = -60$$

$$\Rightarrow x = \frac{-60}{34}$$

$$\Rightarrow x = \frac{-30}{17}$$

Verification

$$\text{L.H.S} = \frac{7}{2} \left(\frac{-30}{17} \right) - \frac{5}{2} \left(\frac{-30}{17} \right)$$

$$= \frac{-30}{17}$$

$$\text{R.H.S} = \frac{20}{3} \left(\frac{-30}{17} \right) + 10$$

$$= \frac{-30}{17}$$

Hence, L.H.S = R.H.S

$$\text{Q8 } \frac{6x+1}{2} + 1 = \frac{7x-3}{3}$$

Sol:

$$\frac{6x+1}{2} + 1 = \frac{7x-3}{3}$$

$$\Rightarrow \frac{6x+1+2}{2} = \frac{7x-3}{3}$$

$$\Rightarrow 18x + 9 = 14x - 6$$

$$\Rightarrow 18x - 14x = -6 - 9$$

$$\Rightarrow 4x = -15$$

$$\Rightarrow x = \frac{-15}{4}$$

Verification

$$\text{L.H.S} = \frac{6\left(\frac{-15}{4}+1\right)}{2}$$

$$= \frac{-45+2+4}{4}$$

$$= \frac{-39}{4}$$

$$\text{R.H.S} = \frac{7\left(\frac{-15}{4}-3\right)}{3}$$

$$= \frac{-105-12}{12}$$

$$= \frac{-39}{4}$$

Hence, L.H.S = R.H.S

$$\text{Q9. } \frac{3a-2}{3} + \frac{2a+3}{2} = a + \frac{7}{6}$$

Sol:

$$\frac{3a-2}{3} + \frac{2a+3}{2} = a + \frac{7}{6}$$

$$\Rightarrow \frac{6a-4a+6a+9}{6} = a + \frac{7}{6}$$

$$\Rightarrow 12a + 5 = 6a + 7$$

$$\Rightarrow 12a - 6a = 7 - 5$$

$$\Rightarrow 6a = 2$$

$$\Rightarrow a = \frac{2}{6}$$

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

Verification

$$\text{L.H.S} = \frac{3\left(\frac{1}{3}-2\right)}{3} + \frac{2\left(\frac{1}{3}+3\right)}{2}$$

$$= \frac{-1}{3} + \frac{11}{6}$$

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

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

$$\text{R.H.S} = \frac{1}{3} + \frac{7}{6}$$

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

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

$$\text{Q10. } x - \frac{x-1}{2} = 1 - \frac{x-2}{3}$$

Sol:

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

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

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

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

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

$$\Rightarrow 5x = 7$$

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

$$\text{L.H.S} = \frac{7}{5} - \frac{\frac{7}{5}-1}{2}$$

$$= \frac{7}{5} - \frac{1}{5}$$

$$= \frac{6}{5}$$

$$\text{R.H.S} = 1 - \frac{\frac{7}{5}-2}{3}$$

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

$$= \frac{6}{5}$$

Hence, L.H.S = R.H.S

$$\text{Q11 } \frac{3}{4}x - \frac{x-1}{2} = \frac{x-2}{3}$$

Sol:

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

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

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

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

$$\Rightarrow x = 14$$

Verification

$$\text{L.H.S} = \frac{3 \times 14}{4} - \frac{14-1}{2}$$

$$= \frac{21}{2} - \frac{13}{2}$$

$$= \frac{8}{2}$$

$$= 4$$

$$\text{R.H.S} = \frac{14-2}{3}$$

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

$$= 4$$

Hence, L.H.S = R.H.S

$$\text{Q12 } \frac{5x}{3} - \frac{x-1}{4} = \frac{x-3}{5}$$

$$\Rightarrow \frac{20x-3x+3}{12} = \frac{x-3}{5}$$

$$\Rightarrow \frac{17x+3}{12} = \frac{x-3}{5}$$

$$\Rightarrow 85x + 15 = 21x - 36$$

$$\Rightarrow 85x - 21x = -36 - 15$$

$$\Rightarrow 73x = -51$$

$$\Rightarrow x = \frac{-51}{73}$$

Verification

$$\text{L.H.S} = \frac{5\left(\frac{-51}{73}\right)}{3} - \frac{\frac{-51}{73}-1}{4}$$

$$= \frac{-225}{219} - \frac{-124}{292}$$

$$= \frac{-54}{73}$$

$$\text{R.H.S} = \frac{\frac{-51}{73}-3}{5}$$

$$= \frac{-54}{73}$$

Hence, L.H.S = R.H.S

$$\text{Q13 } \frac{3x+1}{16} + \frac{2x-3}{7} = \frac{x+3}{8} + \frac{3x-1}{14}$$

Sol:

$$\frac{3x+1}{16} + \frac{2x-3}{7} = \frac{x+3}{8} + \frac{3x-1}{14}$$

$$\Rightarrow \frac{3x+1}{16} - \frac{x+3}{8} = \frac{3x-1}{14} - \frac{2x-3}{7}$$

$$\Rightarrow \frac{3x+1-2x-6}{16} = \frac{3x-1-4x+6}{14}$$

$$\Rightarrow \frac{x-5}{8} = \frac{-x+5}{7}$$

$$\Rightarrow 7x - 35 = -8x + 40$$

$$\Rightarrow 7x + 8x = 40 + 35$$

$$\Rightarrow 15x = 75$$

$$\Rightarrow x = \frac{75}{15}$$

$$= 5$$

Verification

$$\text{L.H.S} = \frac{3(5)+1}{16} + \frac{2(5)-3}{7}$$

$$= \frac{16}{16} + \frac{7}{7}$$

$$= 2$$

$$\text{R.H.S} = \frac{5+3}{8} + \frac{3(5)-1}{14}$$

$$= \frac{8}{8} + \frac{14}{14}$$

$$= 2$$

Hence, L.H.S = R.H.S

$$\text{Q14 } \frac{1-2x}{7} - \frac{2-3x}{8} = \frac{3}{2} + \frac{x}{4}$$

Sol:

$$\frac{1-2x}{7} - \frac{2-3x}{8} = \frac{3}{2} + \frac{x}{4}$$

$$\Rightarrow \frac{1-2x}{7} = \frac{3}{2} + \frac{x}{4} + \frac{2-3x}{8}$$

$$\Rightarrow \frac{1-2x}{7} = \frac{12+2x+2-3x}{8}$$

$$\Rightarrow \frac{1-2x}{7} = \frac{14-x}{8}$$

$$\Rightarrow 8 - 16x = 98 - 7x$$

$$\Rightarrow 16x - 7x = 8 - 98$$

$$\Rightarrow 9x = -90$$

$$\Rightarrow x = \frac{-90}{9}$$

Verification

$$\text{L.H.S} = \frac{1-2(-10)}{7} - \frac{2-3(-10)}{8}$$

$$= \frac{1+20}{7} - \frac{2+30}{8}$$

$$= 3 - 4$$

$$= -1$$

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

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

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

$$= -1$$

Hence, L.H.S = R.H.S

$$\text{Q15 } \frac{9x+7}{2} - (x - \frac{x-2}{7}) = 36$$

Sol:

$$\frac{9x+7}{2} - (x - \frac{x-2}{7}) = 36$$

$$\Rightarrow \frac{63x+49-14x+2x-4}{14} = 36$$

$$\Rightarrow \frac{51x+45}{14} = 36$$

$$\Rightarrow 51x + 45 = 504$$

$$\Rightarrow 51x = 504 - 45$$

$$\Rightarrow 51x = 459$$

$$\Rightarrow x = \frac{459}{51}$$

$$= 9$$

Verification

$$\text{L.H.S} = \frac{9(9)+7}{7} - (9 - \frac{9-2}{7})$$

$$= \frac{88}{7} - 9 + \frac{7}{7}$$

$$= 44 - 9 + 1$$

$$= 36$$

$$\text{R.H.S} = 36$$

Hence, L.H.S = R.H.S

$$\text{Q16 } 0.18(5x - 4) = 0.5x + 0.8$$

Sol:

$$0.18(5x - 4) = 0.5x + 0.8$$

$$\Rightarrow 0.9x - 0.72 = 0.5x + 0.8$$

$$\Rightarrow 0.9x - 0.5x = 0.8 + 0.72$$

$$\Rightarrow 0.4x = 1.52$$

$$\Rightarrow x = \frac{1.52}{0.4}$$

$$= 3.8$$

Verification

$$\text{L.H.S} = 0.18(5(3.8) - 4)$$

$$= 0.18 \times 15$$

$$= 2.7$$

$$\text{R.H.S} = 0.5(3.8) + 0.8$$

$$= 2.7$$

Hence, L.H.S = R.H.S

$$\text{Q17 } \frac{2}{3x} - \frac{3}{2x} = \frac{1}{2}$$

Sol:

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

$$\Rightarrow \frac{4-9}{6x} = \frac{1}{12}$$

$$\Rightarrow \frac{-5}{6x} = \frac{1}{12}$$

$$\Rightarrow 6x = -60$$

$$\Rightarrow x = \frac{-60}{6}$$

$$\Rightarrow x = -10$$

Verification

$$\text{L.H.S} = \frac{2}{3(-10)} - \frac{3}{2(-10)}$$

$$= \frac{2}{-30} - \frac{3}{-20}$$

$$= \frac{-4+9}{60}$$

$$= \frac{5}{60}$$

$$= \frac{1}{12}$$

$$\text{R.H.S} = \frac{1}{12}$$

Hence, L.H.S = R.H.S

$$\text{Q18 } \frac{4x}{9} + \frac{1}{3} + \frac{13}{108}x = \frac{8x+19}{18}$$

Sol:

$$\frac{4x}{9} + \frac{1}{3} + \frac{13}{108}x = \frac{8x+19}{18}$$

$$\Rightarrow \frac{48x+36+13x}{108} = \frac{8x+19}{18}$$

$$\Rightarrow \frac{61x+36}{108} = \frac{8x+19}{18}$$

Multiply both sides by 108

$$\Rightarrow 61x + 36 = 48x + 114$$

$$\Rightarrow 61x - 48x = 114 - 36$$

$$\Rightarrow 13x = 78$$

$$\Rightarrow x = \frac{78}{13}$$

$$\Rightarrow x = 6$$

Verification

$$\text{L.H.S} = \frac{4(6)}{9} + \frac{1}{3} + \frac{13}{108}(6)$$

$$= \frac{24}{9} + \frac{1}{3} + \frac{13}{18}$$

$$= \frac{48+6+13}{18}$$

$$= \frac{67}{18}$$

$$\text{R.H.S} = \frac{8(6)+19}{18}$$

$$= \frac{67}{18}$$

$$\text{Q19 } \frac{45-2x}{15} - \frac{4x+10}{5} = \frac{15-14x}{9}$$

Sol:

$$\frac{45-2x}{15} - \frac{4x+10}{5} = \frac{15-14x}{9}$$

Multiply by '3'

$$\Rightarrow \frac{45-2x-12x-30}{15} = \frac{15-14x}{3}$$

$$\Rightarrow \frac{15-14x}{5} = \frac{15-14x}{3}$$

$$\Rightarrow 45 - 42x = 75 - 70x$$

$$\Rightarrow 70x - 42x = 75 - 45$$

$$\Rightarrow 28x = 30$$

$$\Rightarrow x = \frac{30}{28}$$

$$\Rightarrow x = \frac{15}{14}$$

Verification

$$\text{L.H.S} = \frac{45 - 2\left(\frac{15}{14}\right)}{15} - \frac{45\left(\frac{15}{14}\right) + 10}{5}$$

$$= \frac{45(7) - 15}{105} - \frac{30 + 70}{35}$$

$$= \frac{300}{105} - \frac{100}{35}$$

$$= 0$$

$$\text{R.H.S} = \frac{15 - 14\left(\frac{15}{14}\right)}{9}$$

$$= 0$$

Hence, L.H.S = R.H.S

$$\text{Q20 } 5\left(\frac{7x+5}{3}\right) - \frac{23}{3} = 13 - \frac{4x-2}{3}$$

Sol:

$$5\left(\frac{7x+5}{3}\right) - \frac{23}{3} = 13 - \frac{4x-2}{3}$$

$$\Rightarrow \frac{35x+25}{3} + \frac{4x-2}{3} = 13 + \frac{23}{3}$$

$$\Rightarrow \frac{35x+25+4x-2}{3} = \frac{39}{3}$$

Multiply by '3'

$$\Rightarrow 39x + 23 = 62$$

$$\Rightarrow 39x = 62 - 23$$

$$\Rightarrow 39x = 39$$

$$\Rightarrow x = 1$$

Verification

$$\text{L.H.S} = 15\left(\frac{7(5)+5}{3}\right) - \frac{23}{3}$$

$$= \frac{60}{3} - \frac{23}{3}$$

$$= \frac{37}{3}$$

$$\text{R.H.S} = 13 - \frac{4(1)-2}{3}$$

$$= \frac{39-2}{3}$$

$$= \frac{37}{3}$$

Hence, L.H.S = R.H.S

$$\text{Q21 } \frac{7x-1}{4} - \frac{1}{3}(2x - \frac{1-x}{2}) = \frac{10}{3}$$

Sol:

$$\frac{7x-1}{4} - \frac{1}{3}\left(2x - \frac{1-x}{2}\right) = \frac{10}{3}$$

$$\Rightarrow \frac{7x-1}{4} - \frac{2x}{3} + \frac{1-x}{3} = \frac{10}{3}$$

$$\Rightarrow \frac{21x-3-8x+2-2x}{12} = \frac{10}{3}$$

$$\Rightarrow 11x - 1 = 40$$

$$\Rightarrow 11x = 41$$

$$\Rightarrow x = \frac{41}{11}$$

Verification

$$\text{L.H.S} = \frac{75\left(\frac{41}{11}\right) - 1}{4} - \frac{1}{3}\left(2\left(\frac{41}{11}\right) - \frac{1 - \frac{41}{11}}{2}\right)$$

$$= \frac{276}{44} - \frac{82}{33} + \frac{-30}{66}$$

$$= \frac{10}{3}$$

$$\text{R.H.S} = \frac{10}{3}$$

Hence, L.H.S = R.H.S

$$\text{Q22 } \frac{0.5(x-0.4)}{0.35} - \frac{0.6(x-2.71)}{0.42} = x + 61$$

Sol:

$$\frac{0.5(x-0.4)}{0.35} - \frac{0.6(x-2.71)}{0.42} = x + 61$$

$$\Rightarrow \frac{x-0.4}{0.7} - \frac{x-2.71}{0.7} = x + 6.1$$

$$\Rightarrow \frac{x-0.4-x+2.71}{0.7} = x + 6.1$$

$$\Rightarrow -0.4 + 2.71 = 0.7x + 4.27$$

$$\Rightarrow 0.7x = 2.71 - 0.4 - 4.27$$

$$\Rightarrow 0.7x = -1.96$$

$$\Rightarrow x = \frac{-1.96}{0.7}$$

$$\Rightarrow x = -2.8$$

Verification

$$\text{L.H.S} = \frac{0.5((-2.8)-0.4)}{0.35} - \frac{0.6((-2.8)-2.71)}{0.42}$$

$$= \frac{-1.6}{0.35} + \frac{3.306}{0.42}$$

$$= -4.571 + 7.871$$

$$= 3.3$$

$$\text{R.H.S} = -2.8 + 6.1$$

$$= 3.3$$

Hence, L.H.S = R.H.S

$$\text{Q23 } 6.5x + \frac{19.5x-32.5}{2} = 6.5x + 13 + \frac{13x-26}{2}$$

Sol:

$$6.5x + \frac{19.5x-32.5}{2} = 6.5x + 13 + \frac{13x-26}{2}$$

$$\Rightarrow \frac{19.5x-32.5}{2} - \frac{13x-26}{2} = 13$$

$$\Rightarrow \frac{19.5x-32.5-13x+26}{2} = 13$$

$$\Rightarrow 6.5x - 6.5 = 26$$

$$\Rightarrow 6.5x = 26 + 6.5$$

$$\Rightarrow 6.5x = 32.5$$

$$\Rightarrow x = \frac{32.5}{6.5}$$

$$= 5$$

Verification

$$\text{L.H.S} = 6.5(5) + \frac{19.5(5)-32.5}{2}$$

$$= 65$$

$$\text{R.H.S} = 6.5(5) + 13 + \frac{13(5)-26}{2}$$

$$= 65$$

Hence, L.H.S = R.H.S

$$\text{Q24 } (3x - 8)(3x + 2) - (4x - 11)(2x + 1) = (x - 3)(x + 7)$$

Sol:

$$(3x - 8)(3x + 2) - (4x - 11)(2x + 1) = (x - 3)(x + 7)$$

$$\Rightarrow 9x^2 + 6x - 24x - 16 - 8x^2 - 4x + 22x + 11 = x^2 + 7x - 3x - 21$$

$$\Rightarrow x^2 - 5 = x^2 + 4x - 21$$

$$\Rightarrow 4x = 21 - 5$$

$$\Rightarrow 4x = 16$$

$$\Rightarrow x = \frac{16}{4}$$

$$= 4$$

Verification

$$\text{L.H.S} = (3(4) - 8)(3(4) + 2) - (4(4) - 11)(2(4) + 1)$$

$$= 4(16) - 5(9)$$

$$= 11$$

$$\text{R.H.S} = (4 - 3)(4 + 7)$$

$$= 11$$

Hence, L.H.S = R.H.S

$$\text{Q24 } [(2x + 3) + (x + 5)]^2 + [(2x + 3) - (x + 5)]^2 = 10x^2 + 92$$

Sol:

$$[(2x + 3) + (x + 5)]^2 + [(2x + 3) - (x + 5)]^2 = 10x^2 + 92$$

$$\Rightarrow (3x + 8)^2 + (x - 2)^2 = 10x^2 + 92$$

$$\Rightarrow 9x^2 + 48x + 64x + x^2 - 4x + 4 = 10x^2 + 92$$

$$\Rightarrow 10x^2 - 10x^2 + 44x = 92 - 68$$

$$\Rightarrow 44x = 24$$

$$\Rightarrow x = \frac{24}{44}$$

$$\Rightarrow x = \frac{6}{11}$$

Verification

$$\text{L.H.S} = [(2(\frac{6}{11}) + 3) + (\frac{6}{11} + 5)]^2 + [(2(\frac{6}{11}) + 3) - (\frac{6}{11} + 5)]^2$$

$$= [(\frac{45}{11}) + (\frac{61}{11})]^2 + [(\frac{45}{11}) - (\frac{61}{11})]^2$$

$$= (\frac{106}{11})^2 + (\frac{-16}{11})^2$$

$$= \frac{11492}{121}$$

$$\text{R.H.S} = 10(\frac{6}{11})^2 + 92$$

$$= \frac{360}{121} + 92$$

$$= \frac{11492}{121}$$

Hence, L.H.S = R.H.S
