

Linear Equations Worksheet

$$\begin{aligned} 1) \quad 6x + 9 &= 8 - 4x \\ 6x + 4x &= -1 \\ x &= -\frac{1}{10} \end{aligned}$$

$$\begin{aligned} 2) \quad 2x - 3 &= 6x + 5 \\ -3 - 5 &= 6x - 2x \\ -8 &= 4x \\ -2 &= x \end{aligned}$$

$$\begin{aligned} 3) \quad 3x + 5 &= 7x - 8 \\ 5 + 8 &= 7x - 3x \\ 13 &= 4x \\ \frac{13}{4} &= x \end{aligned}$$

$$\begin{aligned} 4) \quad 2(x-3) + 5(x-1) &= 3 \\ 2x - 6 + 5x - 5 &= 3 \\ 7x - 11 &= 3 \\ 7x &= 14 \\ x &= \frac{14}{7} = 2 \end{aligned}$$

$$\begin{aligned} 5) \quad 3(5-x) - 4(3x-2) &= 27 \\ 15 - 3x - 12x + 8 &= 27 \\ -15x + 23 &= 27 \\ 23 - 27 &= 15x \\ -4 &= 15x \\ -\frac{4}{15} &= x \\ -0.27 &= x \end{aligned}$$

$$\begin{aligned} 6) \quad 2(4x-1) - 3(x-2) &= 14 \\ 8x - 2 - 3x + 6 &= 14 \\ 5x + 4 &= 14 \\ 5x &= 10 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} 8) \quad 3(x-1) - 4(x-2) - 6(2x+3) &= 0 \\ 3x - 3 - 4x + 8 - 12x - 18 &= 0 \\ -13x - 13 &= 0 \\ -13x &= 13 \\ x &= -1 \end{aligned}$$

$$\begin{aligned} 7) \quad 3(x-8) + 2(4x-1) &= 3 \\ 3x - 24 + 8x - 2 &= 3 \\ 11x - 26 &= 3 \\ 11x &= 29 \\ x &= \frac{29}{11} = 2.64 \end{aligned}$$

$$\begin{aligned} 9) \quad 4(5-x) - 2(x-3) - 6(2x-1) &= 4 \\ 20 - 4x - 2x + 6 - 12x + 6 &= 4 \\ -18x + 32 &= 4 \\ 32 - 4 &= 18x \\ 28 &= 18x \\ 1.56 &= x \end{aligned}$$

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

$$5(x+2) = 3(2x+1)$$

$$5x+10 = 6x+3$$

$$10-3 = 6x-5x$$

$$7 = x$$

$$11) \frac{5x-3}{4} = \frac{4x-3}{3}$$

$$3(5x-3) = 4(4x-3)$$

$$15x-9 = 16x-12$$

$$-9+12 = 16x-15x$$

$$3 = x$$

$$12) \frac{3x+1}{4} = \frac{2-x}{3}$$

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

$$9x+3 = 8-4x$$

$$9x+4x = 8-3$$

$$13x = 5$$

$$x = 0.38$$

$$13) 3x + \frac{x+4}{3} = \frac{5x+6}{2} \quad \times 6$$

$$6(3x) + 6\left(\frac{x+4}{3}\right) = 6\left(\frac{5x+6}{2}\right)$$

$$18x + 2(x+4) = 3(5x+6)$$

$$18x + 2x + 8 = 15x + 18$$

$$20x + 8 = 15x + 18$$

$$20x - 15x = 18 - 8$$

$$5x = 10$$

$$x = 2$$

$$14) 5x - \frac{3x+1}{2} = \frac{7x+9}{3} \quad \times 6$$

$$6(5x) - 6\left(\frac{3x+1}{2}\right) = 6\left(\frac{7x+9}{3}\right)$$

$$30x - 3(3x+1) = 2(7x+9)$$

$$30x - 9x - 3 = 14x + 18$$

$$21x - 3 = 14x + 18$$

$$21x - 14x = 18 + 3$$

$$7x = 21$$

$$x = 3$$

$$15) \frac{(x+3)}{(x-2)} = \frac{(x+4)}{(x-3)}$$

$$(x+3)(x-3) = (x+4)(x-2)$$

$$x^2 - 3x + 3x - 9 = x^2 - 2x + 4x - 8$$

$$-9 = 2x - 8$$

$$-1 = 2x$$

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

$$16) \frac{(x-6)}{(x+4)} = \frac{(x-2)}{(x+3)}$$

$$(x-6)(x+3) = (x-2)(x+4)$$

$$x^2 - 3x - 18 = x^2 + 2x - 8$$

$$-18 + 8 = 2x + 3x$$

$$-10 = 5x$$

$$\boxed{-2 = x}$$

18)

$$(x+4)^2 + (x-2)^2 - 2x^2 = 5$$

$$x^2 + 8x + 16 + x^2 - 4x + 4 - 2x^2 = 5$$

$$2x^2 + 4x + 20 - 2x^2 = 5$$

$$4x = 5 - 20$$

$$4x = -15$$

$$x = \frac{-15}{4} = \boxed{-3.75}$$

$$17) \frac{2x+3}{x+2} = \frac{4x}{2x+5}$$

$$(2x+3)(2x+5) = 4x(x+2)$$

$$4x^2 + 10x + 6x + 15 = 4x^2 + 8x$$

$$4x^2 + 16x + 15 = 4x^2 + 8x$$

$$16x - 8x = -15$$

$$8x = -15$$

$$x = \frac{-15}{8} = \boxed{-1.88}$$

19)

$$3(x+2)^2 - 7 - 3x^2 = 0$$

$$3(x^2 + 4x + 4) - 7 - 3x^2 = 0$$

$$3x^2 + 12x + 12 - 7 - 3x^2 = 0$$

$$12x + 5 = 0$$

$$12x = -5$$

$$\boxed{x = \frac{-5}{12}} = \underline{\underline{-0.42}}$$

$$20) \frac{x+2}{3} + \frac{x+5}{6} = \frac{1}{3} \quad \times 6$$

$$6 \left(\frac{x+2}{3} \right) + 6 \left(\frac{x+5}{6} \right) = \frac{6}{3}$$

$$2(x+2) + (x+5) = 2$$

$$2x + 4 + x + 5 = 2$$

$$3x + 9 = 2$$

$$3x = 2 - 9$$

$$3x = -7$$

$$\rightarrow \boxed{x = \frac{-7}{3}} = \underline{\underline{-2.33}}$$

