

Solving Linear and Quadratic Proportions

1. $\frac{x+4}{2} = \frac{x+9}{3}$

$$3(x+4) = 2(x+9)$$

$$\begin{array}{r} 3x+12 \quad | \quad 2x+18 \\ -12 \quad \quad | \quad -12 \\ \hline \end{array}$$

$$\begin{array}{r} 3x \quad = \quad 2x+6 \\ -2x \quad | \quad -2x \\ \hline \end{array}$$

$$x = 6$$

3. $\frac{5}{x} = \frac{x+13}{6}$

$$(5)(6) = x(x+13)$$

$$\begin{array}{r} 30 = x^2 + 13x \\ -30 \quad \quad \quad -30 \end{array}$$

$$0 = x^2 + 13x - 30$$

$$0 = (x+15)(x-2)$$

$$x+15=0$$

$$x = -15$$

$$x-2=0$$

$$x = 2$$

1, 30

2, 15

3, 10

6, 5

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

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

$$\begin{array}{r} 6x-9 = 2x-8 \\ -2x \quad \quad -2x \\ \hline \end{array}$$

$$\begin{array}{r} 4x-9 = -8 \\ +9 \quad +9 \end{array}$$

$$\frac{4x}{4} = \frac{1}{4}$$

$$x = \frac{1}{4}$$

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

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

$$x^2 + 2x = -3x + 6$$

$$x^2 + 5x - 6 = 0$$

$$(x-1)(x+6) = 0$$

$$x-1=0$$

$$x = 1$$

$$x+6=0$$

$$x = -6$$

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

$$(x+2)(x-1) = 18$$

$$x^2 - 1x + 2x - 2 = 18$$

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

-18 -18

$$x^2 + x - 20 = 0$$

$$(x-4)(x+5) = 0$$

$$x-4=0$$

$$x=4$$

$$x+5=0$$

$$x=-5$$

$$6. \frac{x+1}{x} = \frac{-7}{x-12}$$

$$(x+1)(x-12) = -7x$$

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

$$x^2 - 11x - 12 = -7x$$

+7x +7x

$$x^2 - 4x - 12 = 0$$

$$(x-6)(x+2) = 0$$

$$x-6=0$$

$$x=6$$

$$x+2=0$$

$$x=-2$$