

Solving Equations By Factoring

1. Solve each equation by factoring.

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

$$(x-1)(x-5) = 0$$

$$x-1=0 \quad x-5=0$$

$$\begin{array}{r} +1 \\ +1 \end{array} \quad \begin{array}{r} +5 \\ +5 \end{array}$$

$$\boxed{x=1} \quad \boxed{x=5}$$

$$c) \frac{2m^2}{m} + \frac{3m}{m} - 10m - 15 = 0$$

$$GCF = m \quad GCF = -5$$

$$\frac{m(2m+3)}{2m+3} - \frac{5(2m+3)}{2m+3} = 0$$

$$GCF = 2m+3$$

$$(2m+3)(m-5) = 0$$

$$2m+3=0 \quad m-5=0$$

$$\begin{array}{r} -3 \\ -3 \end{array} \quad \begin{array}{r} +5 \\ +5 \end{array}$$

$$\frac{2m}{2} = \frac{-3}{2} \quad \boxed{m=5}$$

$$\boxed{m=-1.5}$$

$$e) -x^2 + 16x = -36$$

$$+x^2 - 16x + x^2 - 16x$$

$$0 = x^2 - 16x - 36$$

$$x^2 - 16x - 36 = 0$$

$$\begin{array}{r} 1 \cdot 36 \\ \boxed{2 \cdot 18} \\ 3 \cdot 12 \\ 4 \cdot 9 \\ 6 \cdot 6 \end{array}$$

$$b) \frac{-15x^2}{-15x} + \frac{75x}{-15x} = 0$$

$$GCF = -15x$$

$$-15x(1x-5) = 0$$

$$\frac{-15x}{-15} = 0 \quad x-5=0$$

$$\begin{array}{r} +5 \\ +5 \end{array}$$

$$\boxed{x=0} \quad \boxed{x=5}$$

$$d) \frac{6x^3}{3x} - \frac{33x^2}{3x} - \frac{120x}{3x} = 0$$

$$GCF = 3x$$

$$3x(2x^2 - 11x - 40) = 0$$

$$\begin{array}{r} 1 \cdot 2 \\ 1 \cdot 40 \quad 4 \cdot 10 \\ 2 \cdot 20 \quad 5 \cdot 8 \end{array}$$

$$3x(2x+5)(1x-8) = 0$$

$$\begin{array}{r} 5x \\ 16x \end{array}$$

$$\frac{3x}{3} = 0 \quad 2x+5=0 \quad x-8=0$$

$$\begin{array}{r} -5 \\ -5 \end{array} \quad \begin{array}{r} +8 \\ +8 \end{array}$$

$$\boxed{x=0} \quad \frac{2x}{2} = \frac{-5}{2} \quad \boxed{x=8}$$

$$\boxed{x=-2.5}$$

$$f) x^2 = 7x - 12$$

$$-7x + 12 - 7x + 12$$

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

$$\begin{array}{r} 1 \cdot 12 \\ 2 \cdot 6 \\ \boxed{3 \cdot 4} \end{array}$$

$$(x-3)(x-4) = 0$$

$$x-3=0 \quad x-4=0$$

$$\begin{array}{r} +3 \\ +3 \end{array} \quad \begin{array}{r} +4 \\ +4 \end{array}$$

$$\boxed{x=3} \quad \boxed{x=4}$$

$$(x + 2)(x - 18) = 0$$

$$x + 2 = 0$$

$$\begin{array}{r} -2 \\ -2 \end{array}$$

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

$$x - 18 = 0$$

$$\begin{array}{r} +18 \\ +18 \end{array}$$

$$\boxed{x = 18}$$

$$\boxed{x = 3}$$

$$\boxed{x = 4}$$

g) $2p^3 = 162p$

$$-162p \quad -162p$$

$$\frac{2p^3}{2p} - \frac{162p}{2p} = 0$$

$$\text{GCF} = 2p$$

$$2p(p^2 - 81) = 0$$

$$\begin{array}{cc} \wedge & \wedge \\ p & p & 9 & 9 \end{array}$$

$$2p(p + 9)(p - 9) = 0$$

$$p = 0$$
$$\begin{array}{r} + \\ - \\ 2 \end{array}$$
$$\boxed{p = 0}$$

$$p + 9 = 0$$
$$\begin{array}{r} -9 \\ -9 \end{array}$$
$$\boxed{p = -9}$$

$$p - 9 = 0$$
$$\begin{array}{r} +9 \\ +9 \end{array}$$
$$\boxed{p = 9}$$