

1. Solve by factoring.

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

$$(x - 2)(x - 3) = 0$$

$$x - 2 = 0 \quad \text{or} \quad x - 3 = 0$$

$$x = 2 \quad x = 3$$

Check:  $\left\{ \begin{array}{l} 2^2 - 5(2) + 6 = 0 \\ 4 - 10 + 6 = 0 \\ 0 = 0 \quad \checkmark \\ 3^2 - 5(3) + 6 = 0 \\ 9 - 15 + 6 = 0 \\ 0 = 0 \quad \checkmark \end{array} \right.$

b)  $x^2 - x = 6$

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

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

$$x - 3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$x = 3 \quad x = -2$$

c)  $2x^2 + 2x = x^2 + 8$

$$x^2 + 2x - 8 = 0$$

$$(x + 4)(x - 2) = 0$$

$$x + 4 = 0 \quad \text{or} \quad x - 2 = 0$$

$$x = -4 \quad x = 2$$

d)  $x^2 = 3(x + 6)$

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

$$x^2 - 3x - 18 = 0$$

$$(x + 3)(x - 6) = 0$$

$$x + 3 = 0 \quad \text{or} \quad x - 6 = 0$$

$$x = -3 \quad x = 6$$

e)  $2x^2 - 5x = 3x^2 + 2x + 6$

$$0 = x^2 + 7x + 6$$

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

$$x + 1 = 0 \quad x + 6 = 0$$

$$x = -1 \quad x = -6$$

f)  $2x^2 + x = 6$

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

$$\overbrace{2x^2 + x} - 6 = 0$$

$$2x^2 - 3x + 4x - 6 = 0$$

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

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

$$2x - 3 = 0 \quad \text{or} \quad x + 2 = 0$$

$$2x = 3$$

$$x = -2$$

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

$P = -12$   
 $S = 1$   
 $\boxed{-3, 4}$