

## Completing the Square

Solve each equation by completing the square.

1.  $x^2 - 3x = 4$

2.  $x^2 + 5x = 2$

3.  $x^2 - 7x = -3$

4.  $x^2 + 9x = 1$

## Completing the Square

Solve each equation by completing the square.

1.  $x^2 - 3x = 4$

$$x^2 - 3x + \left(\frac{3}{2}\right)^2 = 4 + \left(\frac{3}{2}\right)^2$$

$$x^2 - 3x + \left(\frac{3}{2}\right)^2 = 4 + \frac{9}{4}$$

$$\left(x - \frac{3}{2}\right)^2 = \frac{25}{4}$$

$$x - \frac{3}{2} = \pm \sqrt{\frac{25}{4}}$$

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

$$x = 4 \text{ or } -1$$

2.  $x^2 + 5x = 2$

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

$$x^2 + 5x + \left(\frac{5}{2}\right)^2 = 2 + \frac{25}{4}$$

$$\left(x + \frac{5}{2}\right)^2 = \frac{33}{4}$$

$$x + \frac{5}{2} = \pm \sqrt{\frac{33}{4}}$$

$$x = \pm \frac{\sqrt{33}}{2} - \frac{5}{2}$$

3.  $x^2 - 7x = -3$

$$x^2 - 7x = -3$$

$$x^2 - 7x + \left(\frac{7}{2}\right)^2 = -3 + \left(\frac{7}{2}\right)^2$$

$$\left(x - \frac{7}{2}\right)^2 = -3 + \frac{49}{4}$$

$$x - \frac{7}{2} = \pm \sqrt{\frac{37}{4}}$$

$$x = \pm \frac{\sqrt{37}}{2} + \frac{7}{2}$$

4.  $x^2 + 9x = 1$

$$x^2 + 9x + \left(\frac{9}{2}\right)^2 = 1 + \left(\frac{9}{2}\right)^2$$

$$\left(x + \frac{9}{2}\right)^2 = 1 + \frac{81}{4}$$

$$x + \frac{9}{2} = \pm \sqrt{\frac{85}{4}}$$

$$x = -\frac{9}{2} \pm \frac{\sqrt{85}}{2}$$