Completing the Square

Solve each equation by completing the square.

1. $x^2 - 2x = 15$

2. $x^2 + 6x = 14$

3. $x^2 - 8x = -5$

4. $x^2 - 10x - 3 = 0$

5. $x^2 + 4x = -1$

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

Completing the Square

Solve each equation by completing the square.

1. $x^2 - 2x = 15$

$x^2 - 2x + \left(\frac{2}{2}\right)^2 = 15 + \left(\frac{2}{2}\right)^2$

$x^2 - 2x + 1 = 15 + 1$

$(x-1)^2 = 16$

$x - 1 = \pm 4$

$x = 5 \text{ or } -3$

2. $x^2 + 6x = 14$

$x^2 + 6x + \left(\frac{6}{2}\right)^2 = 14 + \left(\frac{6}{2}\right)^2$

$x^2 + 6x + 9 = 14 + 9$

$(x+3)^2 = 23$

$x = \pm\sqrt{23} - 3$

3. $x^2 - 8x = -5$

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

$(x-4)^2 = 11$

$x = \pm\sqrt{11} + 4$

4. $x^2 - 10x - 3 = 0$

$x^2 - 10x + 25 = 3 + 25$

$(x-5)^2 = 28$

$x = \pm\sqrt{28} + 5$

5. $x^2 + 4x = -1$

$x^2 + 4x + 4 = -1 + 4$

$(x+2)^2 = 3$

$x = \pm\sqrt{3} - 2$

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

$x^2 - 20x + 100 = -2 + 100$

$(x-10)^2 = 98$

$x = \pm\sqrt{98} + 10$