

**Solving Quadratics
by Completing the Square WS**

Name Finstern

Complete the square for each expression. Write the resulting expression as a binomial squared.

1. $x^2 + 22x + \underline{121} = (x+11)^2$

2. $x^2 - 12x + \underline{36} = (x-6)^2$

3. $x^2 - 3x + \underline{9/4} = (x - 3/2)^2$

4. $x^2 + 9x + \underline{81/4} = (x + 9/2)^2$

Solve each equation by completing the square.

5. $14x + x^2 = 24$

$$x^2 + 14x + 49 = 24 + 49$$

$$(x+7)^2 = 73$$

$$x = -7 \pm \sqrt{73}$$

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

$$x^2 + 2x + 1 = 3 + 1$$

$$(x+1)^2 = 4$$

$$x = -1 \pm 2$$

$$x = 1, -3$$

7. $4x^2 = -12x + 4$

$$4x^2 + 12x = 4$$

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

$$(x + \frac{3}{2})^2 = \frac{13}{4}$$

$$x = -\frac{3}{2} \pm \frac{\sqrt{13}}{2}$$

8. $-3x^2 + 18x = -30$

$$x^2 - 6x + 9 = 10 + 9$$

$$(x-3)^2 = 19$$

$$x = 3 \pm \sqrt{19}$$

9. $x^2 = 3x + 4$

$$x^2 - 3x + \frac{9}{4} = 4 + \frac{9}{4}$$

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

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

$$x = 4, -1$$

10. $2d^2 = 8 + 10d$

$$2d^2 - 10d = 8$$

$$d^2 - 5d + \frac{25}{4} = 4 + \frac{25}{4}$$

$$(d - \frac{5}{2})^2 = \frac{41}{4}$$

$$d = \frac{5}{2} \pm \frac{\sqrt{41}}{2}$$