

## Completing the Square/Quadratic Formula

Solve each equation by completing the square.

1)  $n^2 - 14n + 31 = 0$

$$\begin{array}{r} \underline{-31} \quad \underline{-31} \\ n^2 - 14n \quad \underline{\quad} = -31 \end{array}$$

$$\left(-\frac{14}{2}\right)^2 = (-7)^2 = 49$$

$$n^2 - 14n + 49 = 49 - 31$$

$$(n-7)^2 = 18$$

$$\sqrt{(n-7)^2} = \pm\sqrt{18}$$

$$n-7 = \pm\sqrt{18}$$

$$n = 7 \pm\sqrt{18}$$

$$\sqrt{18} = \sqrt{9} \cdot \sqrt{2} = 3\sqrt{2}$$

$$\underline{n = 7 + 3\sqrt{2}} \quad \underline{n = 7 - 3\sqrt{2}}$$

2)  $b^2 - 12b - 79 = 0$

3)  $k^2 + 16k + 61 = 0$

4)  $x^2 - 20x + 96 = 0$



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Solve each equation using the quadratic formula.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

9)  $9r^2 + 2r - 3 = 0$

10)  $4x^2 - x - 33 = 0$

$a = 9 \quad b = 2 \quad c = -3$

$$x = \frac{-2 \pm \sqrt{2^2 - 4(9)(-3)}}{2(9)}$$

$$x = \frac{-2 \pm \sqrt{4 + 108}}{18}$$

$$x = \frac{-2 \pm \sqrt{112}}{18}$$

$$\sqrt{112} = \sqrt{16} \cdot \sqrt{7} = 4\sqrt{7}$$

$$x = \frac{-2 \pm 4\sqrt{7}}{18}$$

$$x = \frac{-1 \pm 2\sqrt{7}}{9}$$

11)  $p^2 + 3p + 5 = 0$

12)  $3m^2 + 2m - 56 = 0$