11/27/12 The Quadratic formula!!!

The quadratic formula allows you to solve any quadratic equation. It is:

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

It gives you the answer, so long as you know what a, b, and c are.

Example ① Solve: $x^2 + 6x + 6 = 0$ $a = 1$ $b = 6$ $c = 6$

① Get into standard form

② Write a, b, and c.

③ plug into quadratic formula.

$$x = -\frac{6 \pm \sqrt{36 - 4(1)(6)}}{2(1)}$$

$$x = -\frac{6 \pm \sqrt{36 - 24}}{2(1)}$$

$$x = -\frac{6}{2} \pm \frac{\sqrt{12}}{2} \quad \leftarrow \text{reduce the radical}$$

$$x = -3 \pm \frac{2\sqrt{3}}{2} \quad \rightarrow \quad \boxed{x = -3 \pm \sqrt{3}}$$

Example ② $\cancel{7}\left(\dfrac{4 - 2y^2}{\cancel{7}}\right) = (2y)\,7$

$$4 - 2y^2 = 14y$$
$$\underline{-14y \quad -14y}$$

$$4 - 2y^2 - 14y = 0$$
$$-2y^2 - 14y + 4 = 0$$

$a = -2$ $b = -14$ $c = 4$

$$x = \frac{14 \pm \sqrt{196 - 4(-2)(4)}}{2(-2)}$$

$$x = \frac{14 \pm \sqrt{196 + 32}}{-4}$$

$$x = \frac{14}{-4} \pm \frac{\sqrt{228}}{-4} \quad 4 \cdot 57$$

$$x = -\frac{7}{2} \pm \frac{2\sqrt{57}}{-4}$$

$$\boxed{x = -\frac{7}{2} \pm -\frac{\sqrt{57}}{2} \quad \text{or} \quad -\frac{7}{2} \pm \frac{\sqrt{57}}{2}}$$