Summary of Solving Quadratic Equations		
Method	When to Use	Example
Factoring Sum/product GCF	c = 0 or the expression is easily factorable.	$x^2 + 4x + 3 = 0$
Square Roots	The variable side of the equation is a perfect square.	$(x - 5)^2 = 24$
Completing the Square	a = 1 and b is an even number.	$x^2 + 6x - 10 = 0$
Quadratic Formula	Numbers are large or complicated, and the expression does not factor or does not factor easily.	$5x^2 - 7x - 8 = 0$

Solve by any method.

sum/product

1. $1x^2 - 4x - 5 = 0$

Sum	product
-4	-5
$-5+1$	$-5 \cdot 1$

$\frac{-5}{1} \quad \frac{1}{1}$

$(1x-5)(1x+1) = 0$

$x-5=0$ $+5 \quad +5$ $x=5$

$x+1=0$ $-1 \quad -1$ $x=-1$

square root

2. $8x^2 - 8x + 2 = 0$

$2(4x^2 - 4x + 1) = 0$

$2(2x-1)^2 = 0$

$2x-1=0$ $+1 \quad +1$

$\frac{2x}{2} = \frac{1}{2}$ $x = \frac{1}{2}$

$a^2-b^2=(a-b)(a+b)$

$a^2-2ab+b^2=(a-b)^2$

$a^2+2ab+b^2=(a+b)^2$

3. $4x^2 - 8x + 1 = 0$ (a, b, c)

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a} = \frac{-(-8) \pm \sqrt{(-8)^2-4(4)(1)}}{2(4)}$$

$$= \frac{8 \pm \sqrt{64-16}}{8} = \frac{8 \pm \sqrt{48}}{8}$$

$2 \mid 48$, $2 \mid 24$, $2 \mid 12$, $2 \mid 6$, 3

$$= \frac{8 \pm 4\sqrt{3}}{8} = \frac{2 \pm \sqrt{3}}{2}$$

4. $12(x+5)^2 - 48 = 0$

$+48 \quad +48$

$\frac{12(x+5)^2}{12} = \frac{48}{12}$

$\sqrt{(x+5)^2} = \sqrt{4}$

$x+5 = \pm 2$

$-5 \quad -5$

$x = -5 \pm 2$

$x = -5+2$ → $x = -3$

$x = -5-2$ → $x = -7$

5. $x^2 + 6x = -7$ $+9 \quad +9$

$\frac{1}{2}(6) = 3$

$3^2 = 9$

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

$\sqrt{(x+3)^2} = \sqrt{2}$

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

$-3 \quad -3$

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

6. $\frac{3}{2}x^2 - 9 = 0$

$+9 \quad +9$

$\frac{2}{3} \cdot \frac{3}{2}x^2 = 9 \cdot \frac{2}{3}$

$\sqrt{x^2} = \sqrt{6}$

$x = \pm\sqrt{6}$