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### Linear Equations

$$2x+3=23$$

Degree  $\rightarrow 1$   
# of solutions  $\rightarrow 1$

### Quadratic Equations

$$x^2+5x+6=0$$

Degree  $\rightarrow 2$   
# of solutions  $\rightarrow 2$

### Three Methods for Solving Quadratic Equations

#### 1. Factoring Method

$$x^2+5x+6=0$$

$$(x+2)(x+3)=0$$

$$\downarrow \qquad \downarrow$$
$$x+2=0 \text{ or } x+3=0$$

$$x=-2 \text{ or } x=-3$$

#### 2. Difference of Squares

$$49x^2-1=0$$

$$(7x+1)(7x-1)=0$$

$$7x+1=0 \text{ or } 7x-1=0$$

$$7x=-1 \text{ or } 7x=1$$

$$x=-\frac{1}{7} \text{ or } x=\frac{1}{7}$$

\* The 2 solutions  
will ~~at~~ always be  
opposites \*

$$\text{Ex: } x^2 + 4x + 4 = 0$$

$$(x+2)(x+2) = 0$$

$$\downarrow \qquad \qquad \downarrow$$
$$x+2=0 \text{ or } x+2=0$$

$$x = -2 \text{ or } x = -2$$

\* This is a perfect square because it can be expressed as  $(x+2)^2 = 0$ .

\* Perfect square always has one solution.