

Solving Quadratic Equations by Completing the Square

complete the square

$$x^2 + bx = d$$

Add $(\frac{b}{2})^2$ on both sides

$$x^2 + bx + (\frac{b}{2})^2 = d + (\frac{b}{2})^2$$

$$(x + \frac{b}{2})^2 = d + (\frac{b}{2})^2$$

Square Root
Property

$$\text{If } x^2 = d$$

$$x = \pm\sqrt{d}$$

Find the value of c that makes each trinomial a perfect square.

1) $x^2 + 26x + c$

$$c = (\frac{b}{2})^2 = (\quad)^2 =$$

$$x^2 + 26x + \quad = (\quad + \quad)^2$$

2) $x^2 - 13x + c$

$$c = (\quad)^2 =$$

$$x^2 - 13x + \quad = (\quad)^2$$

3) Solve the equation by completing the square $x^2 + 6x - 16 = 0$

$$\begin{array}{rcl} x^2 + 6x - 16 & = & 0 \\ + & & + \end{array}$$

$$x^2 + 6x =$$

$$x^2 + 6x + = 16 +$$

$$(\quad + \quad)^2 =$$

$$+ = \pm \sqrt{\quad}$$

$$+ = \pm$$

$$x = \pm -$$

The Solutions are and