

## SOLVING QUADRATIC EQUATIONS BY COMPLETING THE SQUARE

**RULE #1** In order to complete the square, the leading coefficient must be 1.

### Problem

$$x^2 + 4x - 6 = 0$$

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### Procedure

Move everything with a variable to the left side of the = sign and move the constant to the right.

The left side needs to be a perfect square trinomial.

$$a^2 + 2ab + b^2 \quad \text{or} \quad a^2 - 2ab + b^2$$
$$(a+b)^2 \quad \quad \quad (a-b)^2$$

Find the number to add to both sides of the equation to create a perfect square trinomial.

$$\text{Use } \left(\frac{b}{2}\right)^2$$

Now solve for x.

Do not forget  $\pm$  sign.

Solve the following by completing the square

a)  $x^2 - 14x + 33 = 0$

b)  $\frac{1}{3}x^2 - 5x + 12 = 0$

c)  $4x^2 - 32x + 40 = 0$

d)  $3x^2 - 2x + 8 = 0$

$$e) \quad ax^2 + bx + c = 0$$