$$(x-7)^{2} + 5 = 86$$

$$-5 - 5$$

$$(x-7)^{2} - 781$$

$$(x-7)^{2} + 781$$

$$(x-7)^{2} - 781$$

2. Solve:

$$(x + 2)^{2} + 63 = 27$$

$$-63 - 63$$

$$(x+2)^{2} = +36$$

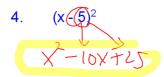
$$x+2 = (+6i)$$

$$-2 = -2 + 6i$$

Expand each:

3. $(x + 4)^2$





Factor each:

5. $x^2(-)6x+9$



6.
$$x^2 + 16x + 64$$

Solving Quadratic Equations:

- 1. Factoring. Works only if quadratic is factorable.
- 2. Square Roots. Works only if b=0
- 3. Graphing. Works only if solutions are real #'s
- 4. Quadratic Formula. ALWAYS WORKS!
- 5. Completing the Square. Works only if a=1 and best if b is even.

Solve by factoring the left side of the equation.

$$x^{2}-6x+9=25$$
 $(x-3)^{2}=25$
 $x-3=\pm 5+3$
 $x=6-2$

Fill in the blanks.

1.
$$x^2 + 20x + 106 = (x + 10)^2$$

2.
$$x^2 - 4x + 4 = (x - 2)^2$$

 $x^2 + 12x + 36 = (x + 6)^2$
 $x^2 - 144x + 5184 = (x - 72)^2$

This is called "completing the square"

In general, to complete the square:

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

What would you fill each blank with in order to complete the square?

3.
$$x^2 + 7x + \frac{49}{4} = (x + \frac{3}{2})^2$$

4.
$$x^2 - 11x + \frac{121}{7} = (x - 1)^2$$

Solving equations by completing the square:

- a must equal 1
- best if b is even
- 1. Write equation in the form: $x^2 + bx = c$
- 2. Complete the square by adding $\left(\frac{b}{2}\right)^2$ to both sides.

$$x^{2} + bx + \left(\frac{b}{2}\right)^{2} = c + \left(\frac{b}{2}\right)^{2}$$

- 3. Rewrite equation in the form: $(x + \frac{b}{2})^2 = c + (\frac{b}{2})^2$
- 4. Solve using square roots.



Solve each by completing the square.

1.
$$x^2 + 8x = 9$$

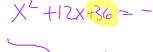
$$\frac{x^{2}+14x-4=9}{\sqrt{(x+4)^{2}}=\sqrt{53}}$$
 $\frac{x^{2}+14x-4=9}{\sqrt{(x+5)^{2}}=\sqrt{26}}$
 $\frac{x^{2}+14x-4=9}{\sqrt{(x-5)^{2}}=\sqrt{26}}$
 $\frac{x^{2}+14x-4=9}{\sqrt{(x-5)^{2}}=\sqrt{26}}$
 $\frac{x^{2}+14x-4=9}{\sqrt{(x-5)^{2}}=\sqrt{26}}$
 $\frac{x^{2}+15x+26}{\sqrt{(x-5)^{2}}=\sqrt{26}}$

2.
$$x^2 - 10x - 1 = 0$$

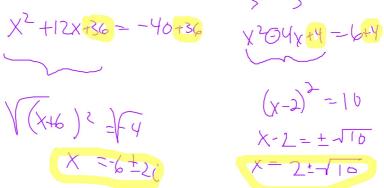
Solve each by completing the square.

3.
$$x^2 + 12x + 40 = 0$$

4.
$$3x^2 - 12x = 18$$







$$(x-2)$$
 - $(0$ $x-2 = \pm \sqrt{0}$