Algebra 2 Name _____

4-6b Completing the Square Date _____ **A#5**

Goal: 1) To solve equations by completing the square
2) To rewrite equations in vertex form

Review

Solve the following using square roots.

a. $x^2 - 25 = 0$ b. $(x-3)^2 = 16$ c. $-2(x+1)^2 + 10 = 0$

Solve the following by factoring.

d. $x^2 + 3x - 10 = 0$ e. $3x^2 + 14x + 15 = 0$

How do you identify the solutions to a quadratic by graphing?

Solving a Perfect Square Trinomial Equation: Solve for *x.*

Ex 1 $x^2 + 12x + 36 = 25$ **Ex 2** $16x^2 + 8x + 1 = 7$

Practice

1. $x^2 - 22x + 121 = 225$ 2. $25x^2 - 30x + 9 = 11$

Algebra 2
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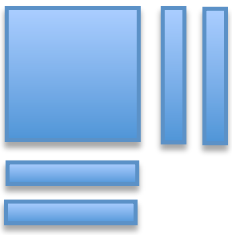
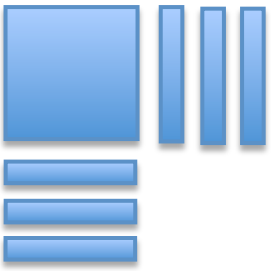
Rationale to Completing the Square: Visual

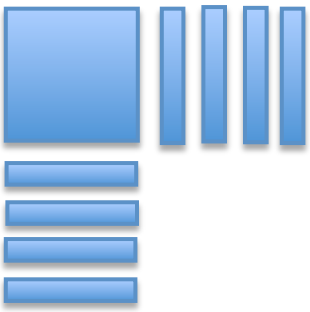
How many tiles needed to be added in order to complete the square?



$x^2 + 4x + \_\_\_\_$



$x^2 + 6x + \_\_\_\_$



$x^2 + 8x + \_\_\_\_$

Therefore, the missing number of blocks can be written as _____

Practice: Find the missing term that would complete each square. Then write as a perfect square.

3. $x^2 + 22x +$

4. $x^2 - 30x +$

5. $x^2 + 5x +$

Solving Quadratics by Completing the Square

Ex 3 $x^2 + 10x - 1 = 0$

Steps to completing the square

1. Isolate the constant
2. If $a \neq 1$, divide by a
3. Add missing term, $\left(\frac{b}{2}\right)^2$, to both sides
4. Factor trinomial $(\quad)^2$
5. Find square roots
6. Solve for x

Practice

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

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Quadratic Equation	1. $r^2 + 8r = 48$	2. $x^2 - 8x = -15$	3. $x^2 - 2x - 3 = 0$	4. $x^2 + 6x + 5 = 0$
Isolate Constant				
Missing Term? $\left(\frac{b}{2}\right)^2$				
Add missing term to both sides				
Factor the left side; perfect square trinomial				
Square root both sides (don't forget ±)				
Split and solve				
Check				

Ex 4 Solve by completing the square
$4x^2 + 20x + 1 = 0$

Steps to completing the square

1. Isolate the constant
2. If $a \neq 1$, divide by a
3. Add missing term, $\left(\frac{b}{2}\right)^2$, to both sides
4. Factor trinomial $(\quad)^2$
5. Find square roots
6. Solve for x

Practice Solve by completing the square $2x^2 + 11x - 23 = -x + 3$

Ex 5 Write the following function in vertex form $y = x^2 + 10x - 9$

Practice Write the following function in vertex form

a. $x = x^2 - 18x + 13$

b. $y = x^2 + 32x - 8$