

## AGENDA

- 1) DO NOW
- 2) Introduce Completing the square
- 3) DEMO: Complete the square  
to Solve for ROOTS
- 4) STATIONS: Complete the square  
to Solve for ROOTS
- 5) Exit Ticket: Complete the square  
to Solve for ROOTS

**HW: Completing the Square Worksheet 1**

**DO NOW: Factor the following**

1)  $x^2 + 6x + 9$

2)  $x^2 + 4x + 4$

3)  $x^2 + 8x + 16$

4)  $x^2 - 10x + 25$

5)  $x^2 - 14x + 49$

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

**These are all called "Perfect Square Trinomials" Why?**

Choose a value for  $c$  to make each equation below a Perfect Square Trinomial.  
Then Factor.

**This is called **Completing the Square****

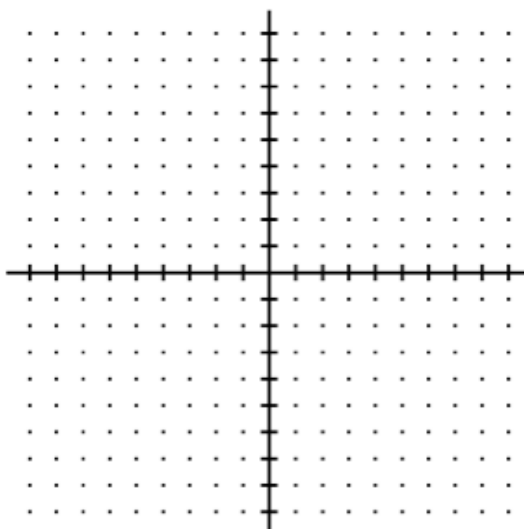
1)  $x^2 + 18x + c$

2)  $x^2 - 4x + c$

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

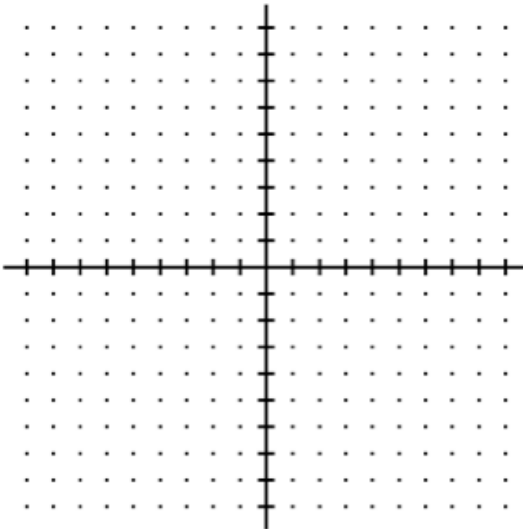
4)  $x^2 + 20x + c$

STATIONS DEMO: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

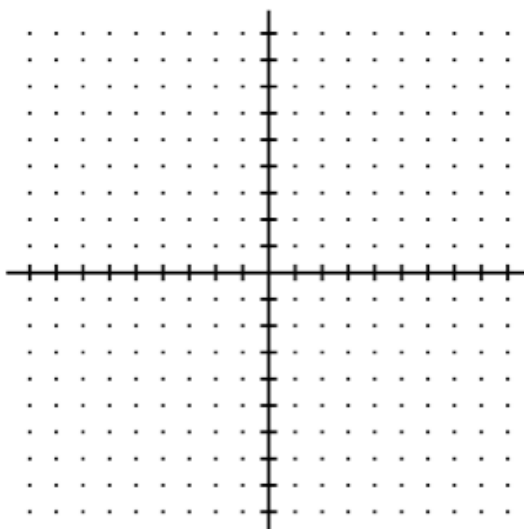
<p>1) What do you WANT the C value to be?</p> $y = x^2 - 10x + 3$ $C = \left(\frac{B}{2}\right)^2$	<p>2) What do you need ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> $0 = x^2 - 10x + 3$
<p>3) Factor NEW equation.</p> $\underline{\hspace{2cm}} = (x \underline{\hspace{2cm}})^2$ <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

HW: Completing the Square Worksheet 1

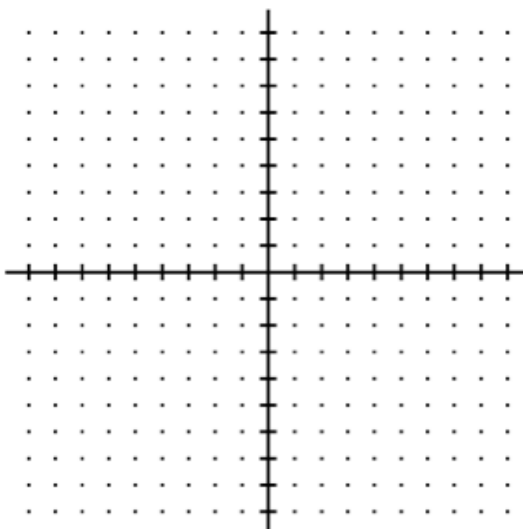
STATION 1: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> <p><b><math>y = x^2 + 6x + 8</math></b></p> <p><math>C = \left(\frac{B}{2}\right)^2</math></p>	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> <p><b><math>0 = x^2 + 6x + 8</math></b></p>
<p>3) Factor NEW equation.</p> <p>_____ = <math>(x \text{ _____})^2</math></p> <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

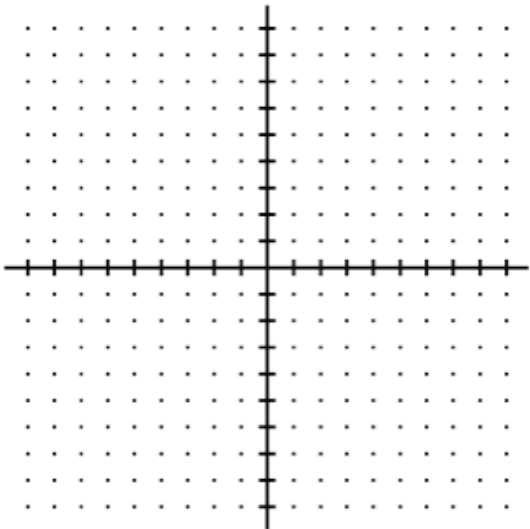
STATION 2: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> <p><b><math>y = x^2 + 14x - 15</math></b></p> <p><math>C = \left(\frac{B}{2}\right)^2</math></p>	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> <p><b><math>0 = x^2 + 14x - 15</math></b></p>
<p>3) Factor NEW equation.</p> <p>_____ = <math>(x \text{ _____})^2</math></p> <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

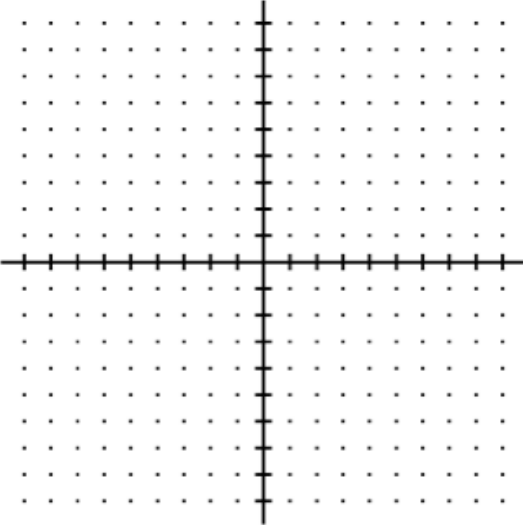
STATION 3: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> <p><b><math>y = x^2 - 12x + 11</math></b></p> <p><math>C = \left(\frac{B}{2}\right)^2</math></p>	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y=0</math> and ADD IT to BOTH SIDES:</p> <p><b><math>0 = x^2 - 12x + 11</math></b></p>
<p>3) Factor NEW equation.</p> <p>_____ = <math>(x \text{ _____})^2</math></p> <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

STATION 4: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

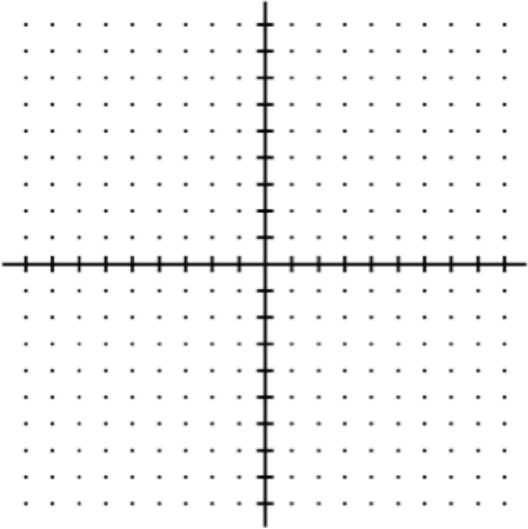
<p>1) What do you WANT the C value to be?</p> $y = x^2 - 2x - 3$ $C = \left(\frac{B}{2}\right)^2$	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> $0 = x^2 - 2x - 3$
<p>3) Factor NEW equation.</p> $\underline{\hspace{2cm}} = (x \underline{\hspace{2cm}})^2$ <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

STATION 5: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

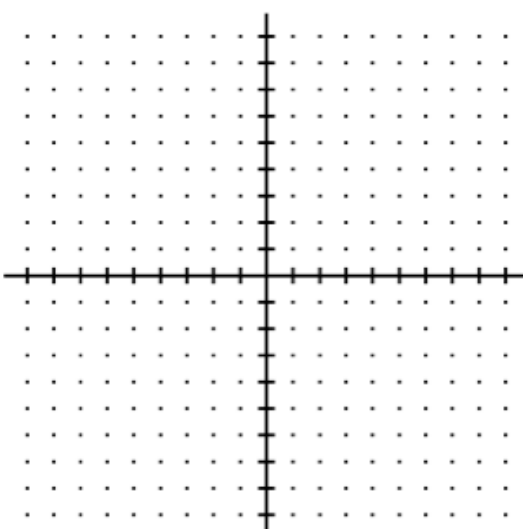
<p>1) What do you WANT the C value to be?</p> <p><b><math>y = x^2 - 12x + 23</math></b></p> <p><math>C = \left(\frac{B}{2}\right)^2</math></p>	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> <p><b><math>0 = x^2 - 12x + 23</math></b></p>
<p>3) Factor NEW equation.</p> <p>_____ = <math>(x \text{ _____})^2</math></p> <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 



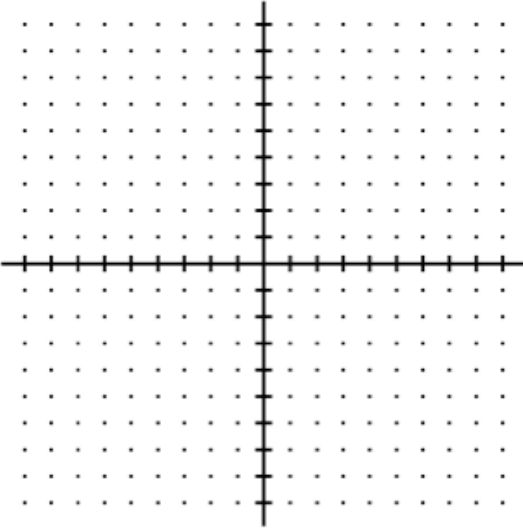
STATION 6: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> $y = x^2 - 8x + 10$ $C = \left(\frac{B}{2}\right)^2$	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> $0 = x^2 - 8x + 10$
<p>3) Factor NEW equation.</p> $\underline{\hspace{2cm}} = (x \underline{\hspace{2cm}})^2$ <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

STATION 7: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> <p><b><math>y = x^2 + 16x + 50</math></b></p> <p><math>C = \left(\frac{B}{2}\right)^2</math></p>	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> <p><b><math>0 = x^2 + 16x + 50</math></b></p>
<p>3) Factor NEW equation.</p> <p>_____ = <math>(x \text{ _____})^2</math></p> <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

STATION 8: Strategy for COMPLETING THE SQUARE  
 $x^2 + Bx + C$

<p>1) What do you WANT the C value to be?</p> $y = x^2 + 6x + 2$ $C = \left(\frac{B}{2}\right)^2$	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> $0 = x^2 + 6x + 2$
<p>3) Factor NEW equation.</p> $\text{_____} = (x \text{ _____})^2$ <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 

Name \_\_\_\_\_

Block \_\_\_\_\_

\_\_\_\_\_ out of 4

EXIT Ticket

Complete the square to solve for x.

$$1) x^2 + 10x + 9 = 0$$

Name \_\_\_\_\_

Block \_\_\_\_\_

\_\_\_\_\_ out of 4

EXIT Ticket

Complete the square to solve for x.

$$1) x^2 + 12x + 11 = 0$$

Block: \_\_\_\_\_

Name: \_\_\_\_\_

Completing the Square Worksheet 1

Find the  $c$  value that will make the perfect-square trinomial. Then Factor.  
 (You **do not** have to solve for the variable.) The first one has been done for you.

5)  $r^2 - 6r + c$       $r^2 - 6r + 9$   
     $(r-3)(r-3)$   
     $(r-3)^2$

6)  $r^2 + 20r + c$

7)  $x^2 - 38x + c$

8)  $a^2 + 12a + c$

13)  $m^2 + 40m + c$

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

15)  $x^2 - x + c$

$x^2 - x + c$

17)  $a^2 - 8a + c$

$a^2 - 8a + c$

Completing the Square Worksheet 1 Continued...

STATION HW: Strategy for COMPLETING THE SQUARE

$$x^2 + Bx + C$$

<p>1) What do you WANT the C value to be?</p> $y = x^2 - 8x + 12$ $C = \left(\frac{B}{2}\right)^2$	<p>2) What do you need to ADD to the equation so that C is what you WANT?</p> <p>Set <math>y = 0</math> and ADD IT to BOTH SIDES:</p> $0 = x^2 - 8x + 12$
<p>3) Factor NEW equation.</p> $\underline{\hspace{2cm}} = (x \underline{\hspace{2cm}})^2$ <p>4) <b>Square root</b> to solve for the roots.</p>	<p>5) Plot the roots</p> 