Warm Up 6/2

Expand the following:

$x(x - 6)$ $= x^2 - 6x$

$(3 - x)(2 + x)$ $= -x^2 + x + 6$

Factor the following:

$x^2 + 9x + 20$ $= (x+4)(x+5)$

$x^2 + 5x - 14$ $= (x+7)(x-2)$

$x^2 + 6x + 9$ $= (x+3)(x+3)$

$= (x+3)^2$

How do we factor this?

ax^2+bx+c

$16 - x^2$

$-x^2+16$

a: -1
b: 0
c: 16
a·c: -16

Factors 16	Sum = 0
-4, 4	0

$-x^2-4x+4x+16$

	$-x^2$	$4x$
x		
4	$-4x$	16

$-x$ 4

$(-x+4)(x+4)$

Name _____ **Homework Questions?** Date _____

Factoring Trinomials where a>1

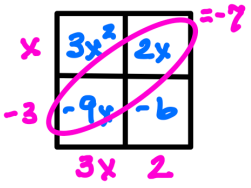
Factor each of the trinomials below. Use either the Box Method or Factor by Grouping. **You must write the expression with 4 terms BEFORE you begin to show your factoring work.**

1. $3x^2 - 7x - 6$

a: 3
b: -7
c: -6
a·c: -18

Factors of -18	Sum = -7
-1, 18	17
-2, 9	7
-3, 6	3
1, -18	-17
2, -9	-7
3, -6	-3

$3x^2+2x-9x-6$



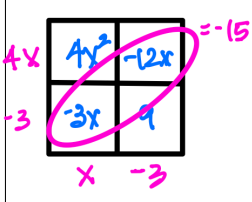
$(3x+2)(x-3)$

2. $4x^2 - 15x + 9$

a: 4
b: -15
c: 9
a·c: 36

Factors of 36	Sum
1, 36	37
2, 18	20
3, 12	15
4, 9	13
6, 6	12
-3, -12	-15

$4x^2-3x-12x+9$



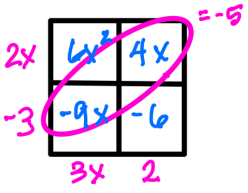
$(4x-3)(x-3)$

3. $6x^2 - 5x - 6$

a: 6
b: -5
c: -6
a·c: -36

Factors of -36	Sum = -5
1, -36	-35
2, -18	-16
3, -12	-9
4, -9	-5
6, -6	0

$6x^2+4x-9x-5$



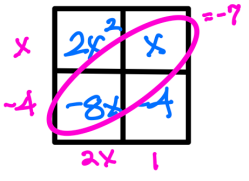
$(2x-3)(3x+2)$

4. $2x^2 - 7x - 4$

a: 2
b: -7
c: -4
a·c: -8

Factors of -8	Sum = -7
-1, 8	7
-2, 4	2
1, -8	-7
2, -4	-2

$2x^2+x-8x-4$



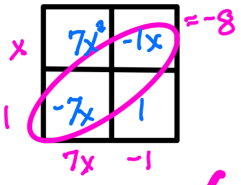
$(2x+1)(x-4)$

5. $7x^2 - 8x + 1$

$a: 7$
$b: -8$
$c: 1$
$a \cdot c: 7$

Factors of	Sum = -8
1, 7	8
-1, -7	-8

$7x^2 - 7x - x + 1$



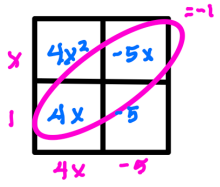
$(x+1)(7x-1)$

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

$a: 4$
$b: -1$
$c: -5$
$a \cdot c: -20$

Factors of -20	Sum = -1
-1, 20	19
-2, 10	8
-4, 5	1
4, -5	-1

$4x^2 - 5x + 4x - 5$



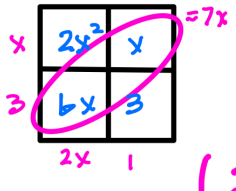
$(4x-5)(x+1)$

7. $2x^2 + 7x + 3$

$a: 2$
$b: 7$
$c: 3$
$a \cdot c: 6$

Factors of 6	Sum = 7
1, 6	7
2, 3	5
-1, -6	-7
-2, -3	-5

$2x^2 + x + 6x + 3$



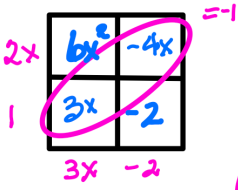
$(2x+1)(x+3)$

8. $6x^2 - x - 2$

$a: 6$
$b: -1$
$c: -2$
$a \cdot c: -12$

Factors of -12	Sum = -1
-1, 12	11
-2, 6	4
-3, 4	1
-4, 3	-1
-6, 2	-4
-12, 1	-11

$6x^2 - 4x + 3x - 2$



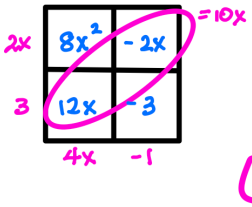
$(2x+1)(3x-2)$

9. $8x^2 + 10x - 3$

$a: 8$
$b: 10$
$c: -3$
$a \cdot c: -24$

Factors of -24	Sum = 10
-1, 24	23
-2, 12	10
-3, 8	5
-4, 6	2

$8x^2 + 12x - 2x - 3$



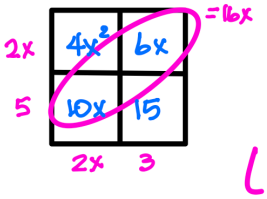
$(2x+3)(4x-1)$

10. $4x^2 + 16x + 15$

$a: 4$
$b: 16$
$c: 15$
$a \cdot c: 60$

Factors of 60	Sum = 16
1, 60	61
2, 30	32
3, 20	23
4, 15	19
5, 12	17
6, 10	16

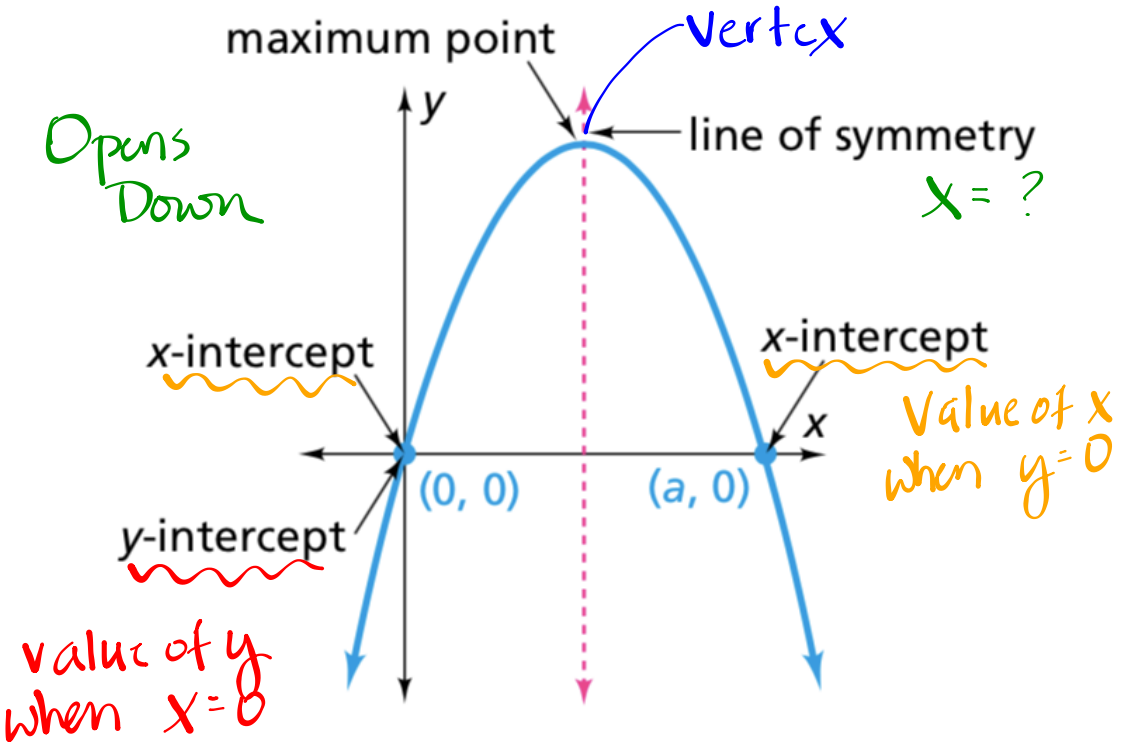
$4x^2 + 6x + 10x + 15$



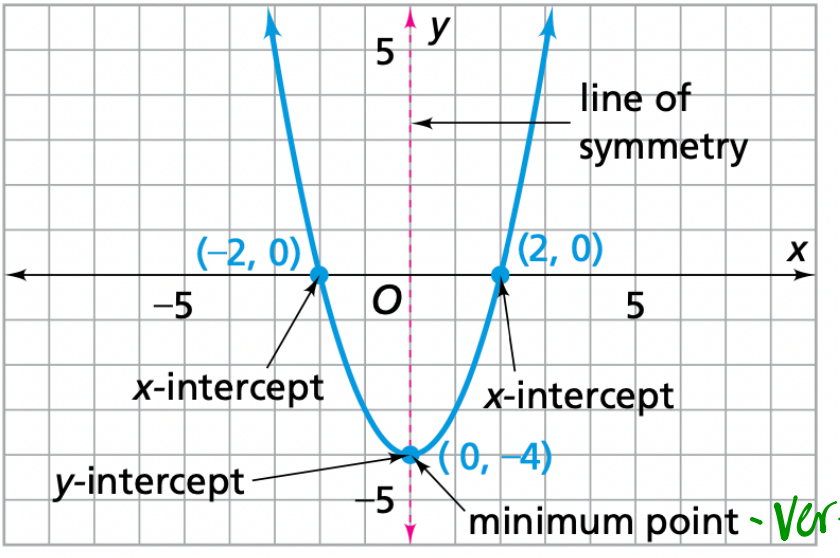
$(2x+5)(2x+3)$

Parabola Vocabulary

These are the Key Features



Same Key Features for a parabola opening up except we now have a MINIMUM.



Key Features of a Parabola:

y-int
x-intercepts
Line of Symmetry (LOS)
vertex
Up/down

Complete Problem 2.4 A and B

Problem 2.4

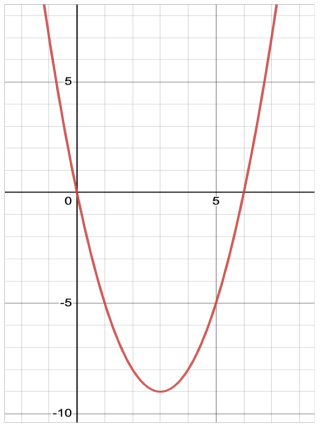
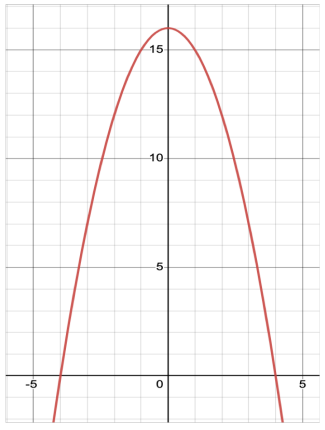
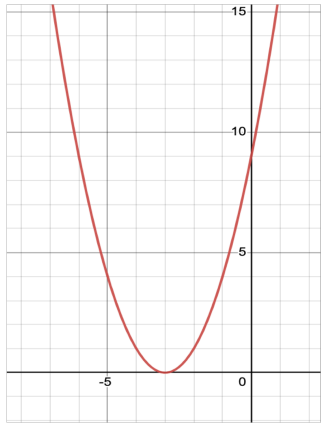
A

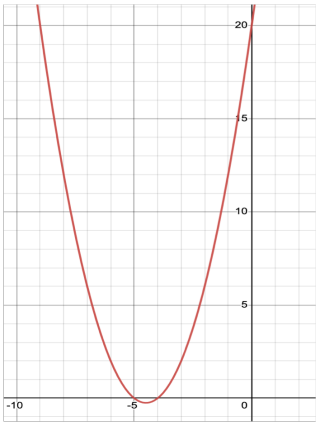
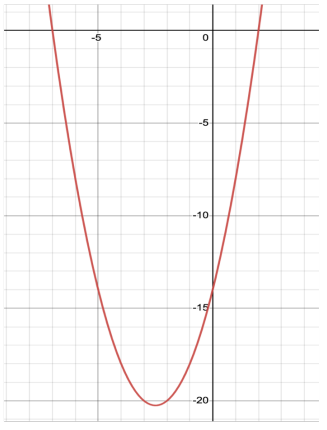
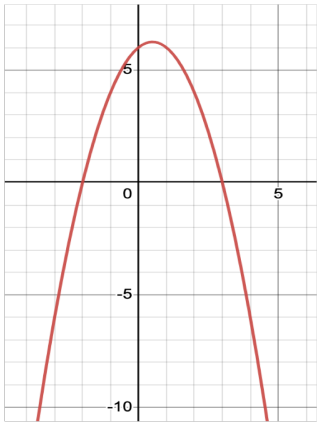
- Graph each equation using Desmos.
- Complete the table provided for each graph.
- While in Desmos, you can hover over points to find the coordinates!

1. $y = x(x - 6)$
2. $y = 16 - x^2$
3. $y = x^2 + 6x + 9$
4. $y = x^2 + 9x + 20$
5. $y = x^2 + 5x - 14$
6. $y = (3 - x)(2 + x)$

Are you beginning to notice patterns between equations and key features?

Problem 2.4 A

	1. 	2. 	3. 
Factored Form	$y = x(x - 6)$		
Expanded Form		$y = 16 - x^2$	$y = x^2 + 6x + 9$
y-intercept			
x-intercept(s)			
Min/Max			
Line of Symmetry			
Opens Up/Down			

	4. 	5. 	6. 
Factored Form			$y = (3 - x)(2 + x)$
Expanded Form	$y = x^2 + 9x + 20$	$y = x^2 + 5x - 14$	
y-intercept			
x-intercept(s)			
Min/Max			
Line of Symmetry			
Opens Up/Down			

Use what you learned in Part A to complete this.

Use equations in both expanded and factored forms!

B Without graphing, describe the graph of each equation. Give as many details as possible.

1. $y = x^2 + 8x + 12$ **2.** $y = (x + 3)(x - 3)$ **3.** $y = -x^2 + 6x$

4. Explain what features of the graph of a function, such as intercepts, maximum/minimum point, and line of symmetry, you can predict from an equation of the function. Describe how you can make these predictions.

Homework

Finish classwork