WELCOME

Math 2

Chapter 12: Quadratics

Last Night's HW: 12.0 Worksheet

Tonight's HW: Graphing Quadratics Worksheet

Quiz: Next Week!

Warm Up

1. a) Distribute & put in standard form: $f(x) = x(7 - x) - 8$

   b) Identify a, b, and c

2. Graph on a number line: $x \geq 3$

Chapter 12 Section 0 Learning Target

I can find the greatest common factor of a given polynomial. And, I can use the F.O.I.L method to multiply two binomials.

Steps for Factoring Polynomials

Step 1: Find the GCF of the polynomials.

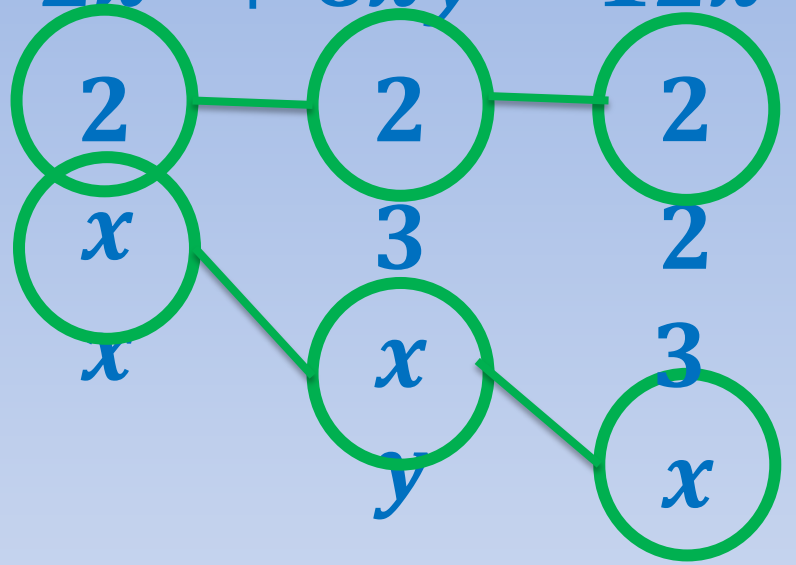
(Common primes)

Step 2: Divide each term by the GCF

(answer in parentheses)

Step 3: Write the GCF outside the parentheses

$$2x^2 + 6xy - 12x$$



$$GCF = 2 \cdot x = 2x$$

$$\frac{2x^2 + 6xy - 12x}{2x}$$

$$2x\,(x + 3y - 6)$$

What we know

Distribute the monomial multiplication to each term in the polynomial and then use multiplication laws.

$$2x^2 \cdot (4x^2 - 3x)$$

Binomial Multiplication

To solve algebraically we distribute the binomials to each other, distribute again and then combine the like terms

$$(3x-4)\cdot(2x+5)$$

$$2x\cdot(3x-4)+5\cdot(3x-4)$$

Distribution (F.O.I.L.) Method

F-irst:

Multiply two first terms

+

O-utside:

Multiply two outside terms

+

I-nside:

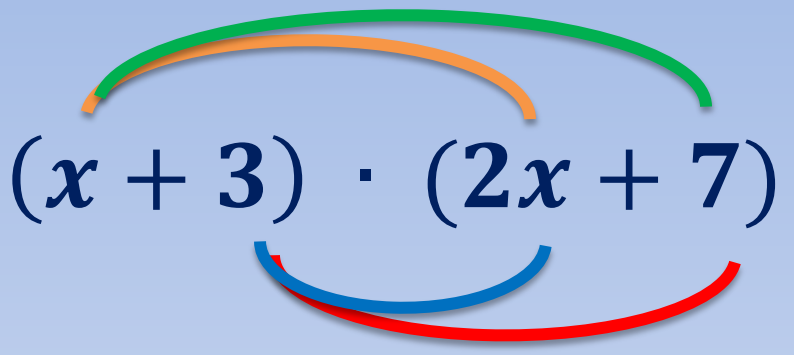
Multiply two inside terms

+

L-ast:

Multiply two last terms

(Combine like terms when done)



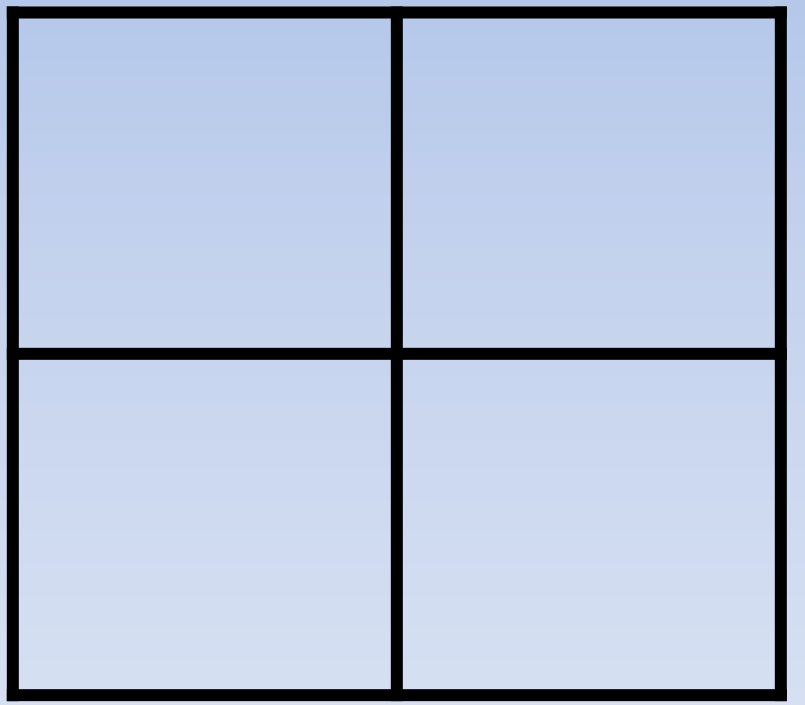
Box Method

This is just another method to help

Choose your favorite!

$$(4x - 3) \cdot (2x + 5)$$

Create a 2x2 grid to help you out with Multiplication



Try These…

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

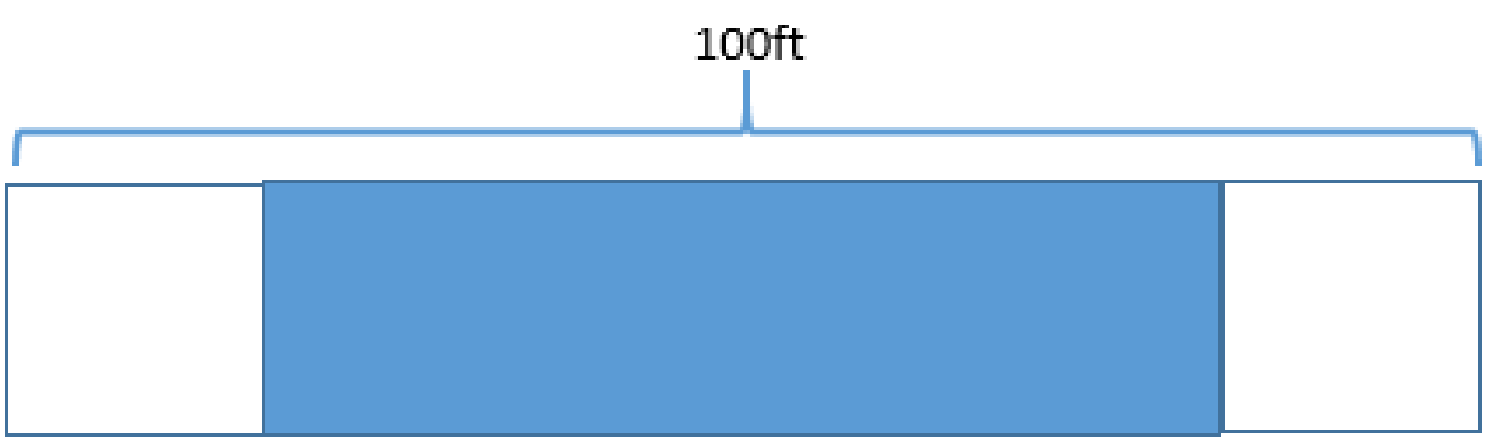
$(x^2 + 3x) \cdot (2x + 5)$

Learning Targets Ch. 12 Section 1

A	I can use quadratic expressions to model real world problems.	12.1
B	I can write a quadratic function in standard form using the distributive property.	12.1
C	I can determine the absolute minimum or maximum of a quadratic function using a graphing calculator.	12.1

Chapter 12 Section 1 Intro to Quadratics

A dog trainer is fencing in a play area for her dogs. The shaded region of the diagram represents the play area. She wants to build two square shaped storage sheds on the side area to hold he equipment. She knows that the total length of the play area & storage sheds must be 100ft in total length.



(Let S represent the side length of the square sheds in ft.)

1. Write an expression to represent the Width of the enclosure.

2. Write an expression to represent the length of the enclosure.

3. Write an expression to represent the Area of the enclosure. Explain.

4. I you haven't already use the distributive property to rewrite the expression.

The expression you have written is called a _____. In math 1 we learned that a_____ can be written in it's standard form...

$$f(x) =$$

5. Write the expression from above as a quadratic function

$$A(s) =$$

6. Identify the a, b, & c of the quadratic function

7. Below we have shown three versions of the play area, describe what happens to the size of the play area as we increase the size of S

8. If we were to draw a graph that represents the size of the play area as S increases predict what it would look like.

9. Using a calculator fill in the remainder of the table and draw a sketch of the function created.

s	f(s)
0	
10	
20	
30	
40	
50	

The Graph you have created is called a _____.

10. Based on this activity make a recommendation for the size of storage shed the dog trainer should build. Explain why with at least 2 complete sentences.

What is a Quadratic?

Quadratic:

Any function where the highest power of x is 2.

$$f(x) = 3x^2 + 2x - 5$$

Standard Form:

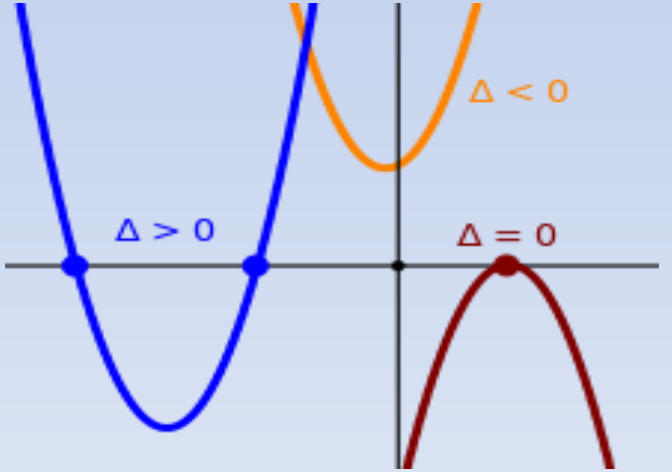
All quadratic functions can be written in the form…

$$f(x) = a(x)^2 + bx + c$$

(a, b, c represent #'s)

(a ≠ 0)

Quadratic Graphs:



(Parabolas)

Identify a,b,c

$f(x) = 3x^2 + 5x - 6$ a= 3 b=5 c=-6

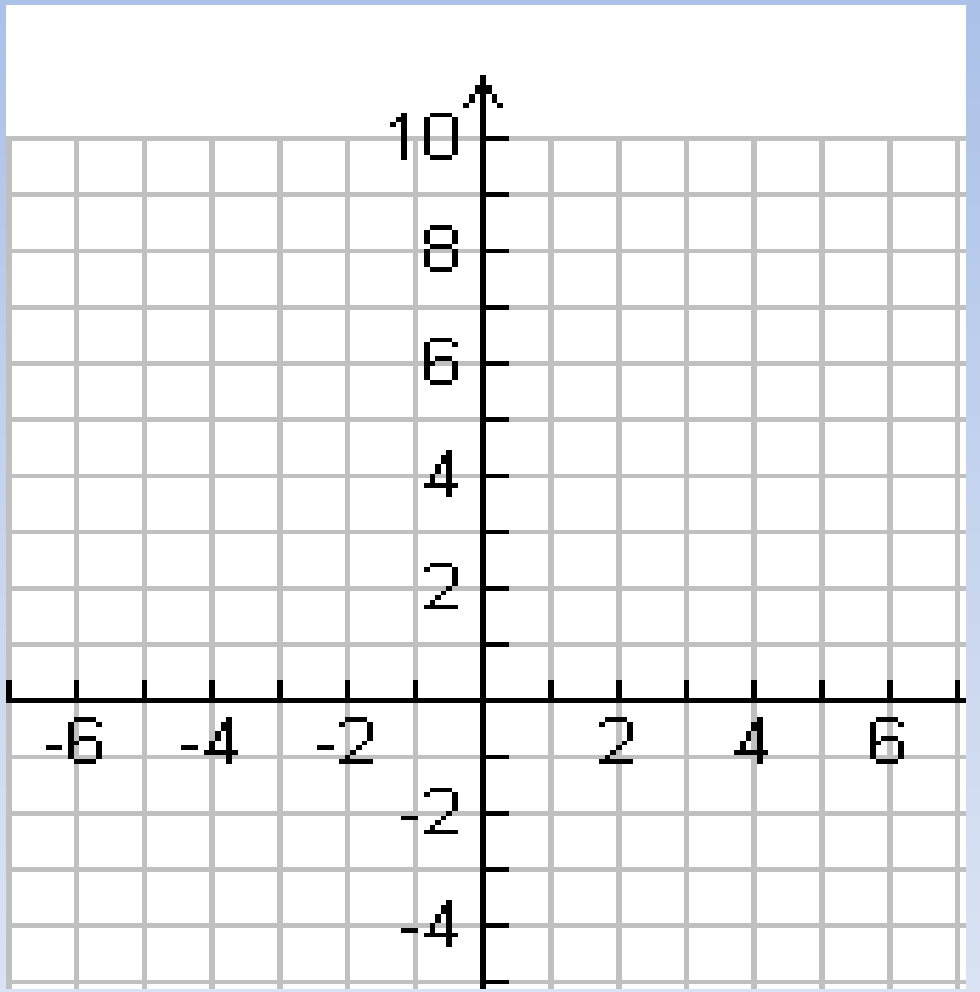
$f(x) = x^2 + 8$ a= 1 b=0 c=8

$f(x) = -2x^2$ a=-2 b=0 c=0

Graphing Using a Table

$f(x) = x^2 + 2$

x	f(x)
-3	
-1	
0	
1	
3	

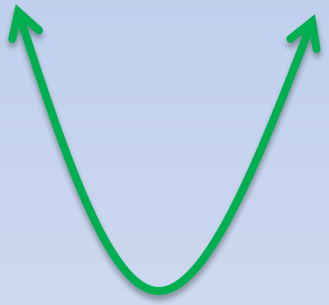


Connect with a curved line

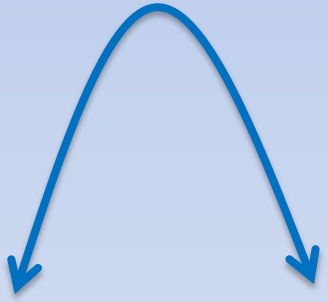
The Graph of a Quadratic

$$f(x) = a(x)^2 + bx + c$$

The graph of a quadratic function is a parabola, a u-shape.



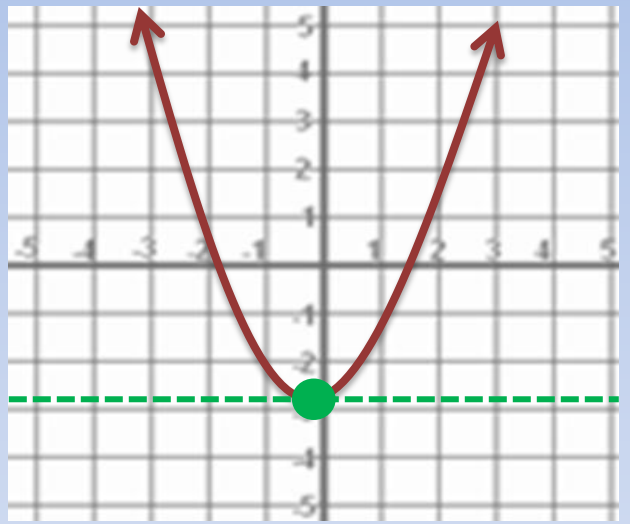
If ‘a’ is **positive**, the parabola opens **up**.



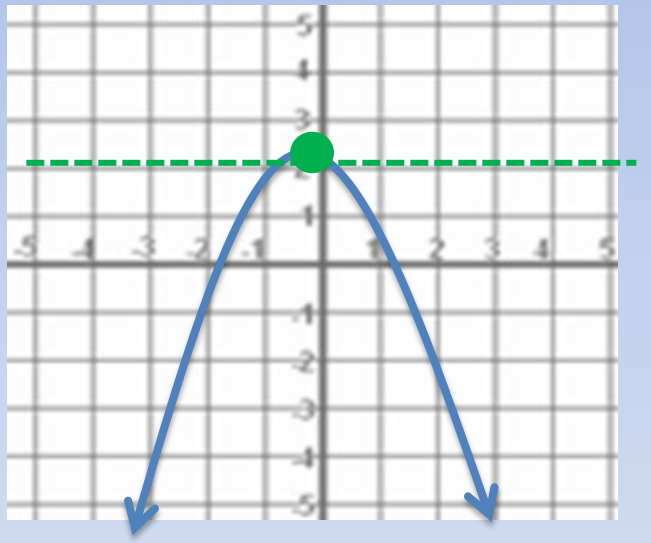
If ‘a’ is **negative**, the parabola opens **down**.

Max or Min

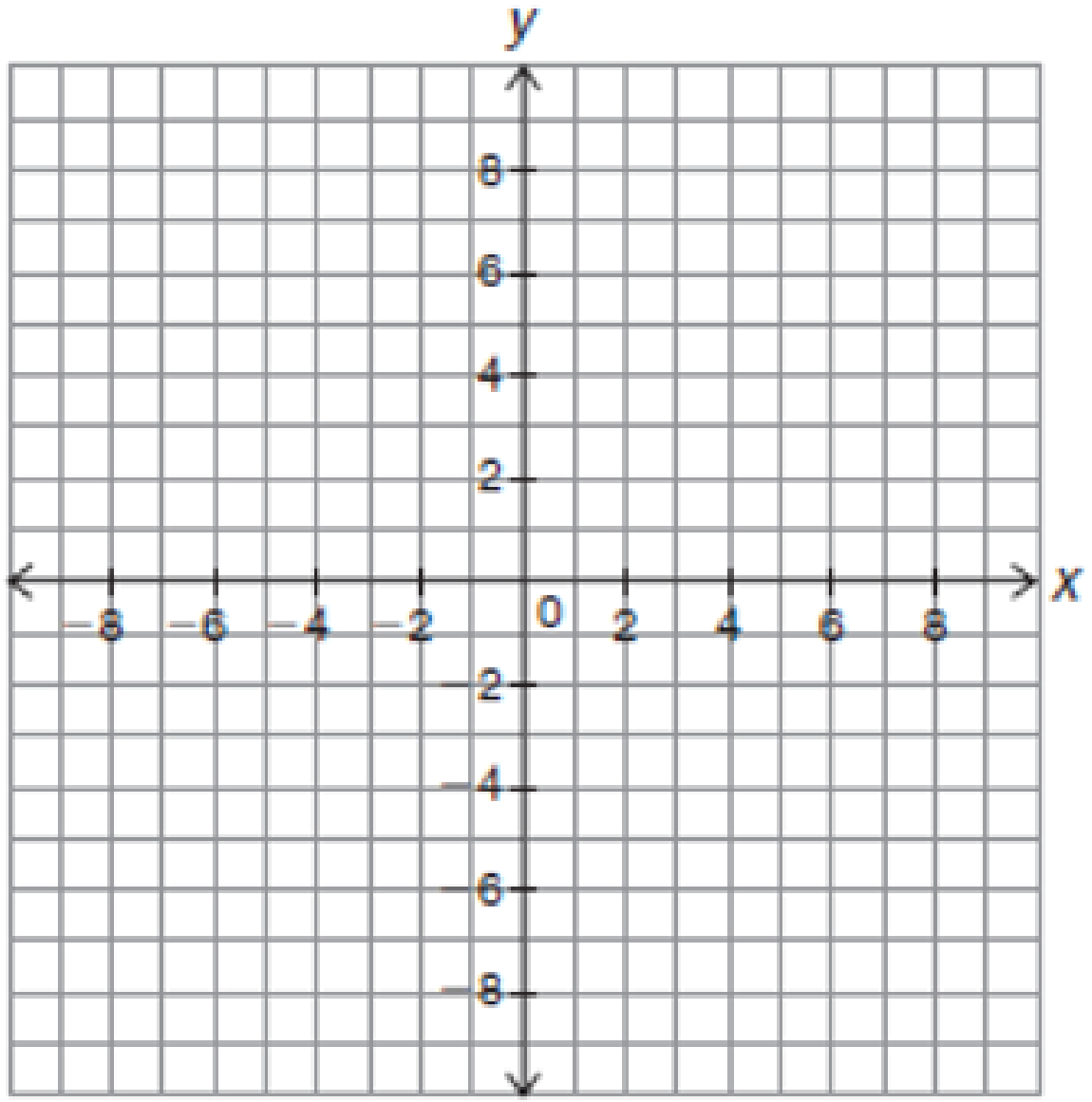
The point that is the highest or lowest on the parabola.



If the parabola opens upward (+a), the vertex is a minimum value.



If the parabola opens **downward (-a)**, the vertex is a **maximum value**.



Opening:

Max or Min:

Zeroes:

Y-intercepts:

Vertex:

Axis of Symmetry:

Domain:

Range: