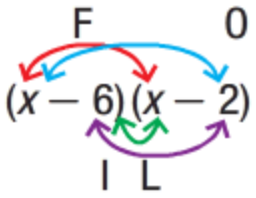
FOIL or Double Distribute

KeyConcept FOIL Method for Multiplying Binomials

Words To multiply two binomials, find the sum of the products of ***F*** the *First terms*, ***O*** the *Outer terms*, ***I*** the *Inner terms*, and ***L*** the *Last terms*.

Examples



	Product of First Terms	Product of Outer Terms	Product of Inner Terms	Product of Last Terms
	↓	↓	↓	↓
$(x-6)(x-2)$ $=$	$(x)(x)$	$+ (x)(-2)$	$+ (-6)(x)$	$+ (-6)(-2)$

$= x^2 - 2x - 6x + 12$ or $x^2 - 8x + 12$

Solve: Use FOIL or DOUBLE DISTRIBUTION method

a) (x-6)(x-2) =

b) (x-2)(x-5) =

LT 3.4	LT 3.5
1. **Solve** quadratic equations. f(x) = ax ^2 + bx +c BY **Graphing** **(x-intercepts where y=0)**	1. **Solve** quadratic equations. f(x) = ax ^2 + bx +c BY **Factoring** **GCF**

Essential Skill 3: Quadratic Functions

LT 3.5 Solving Quadratic Functions by Factoring

Learning Objective

I will be able to . . .

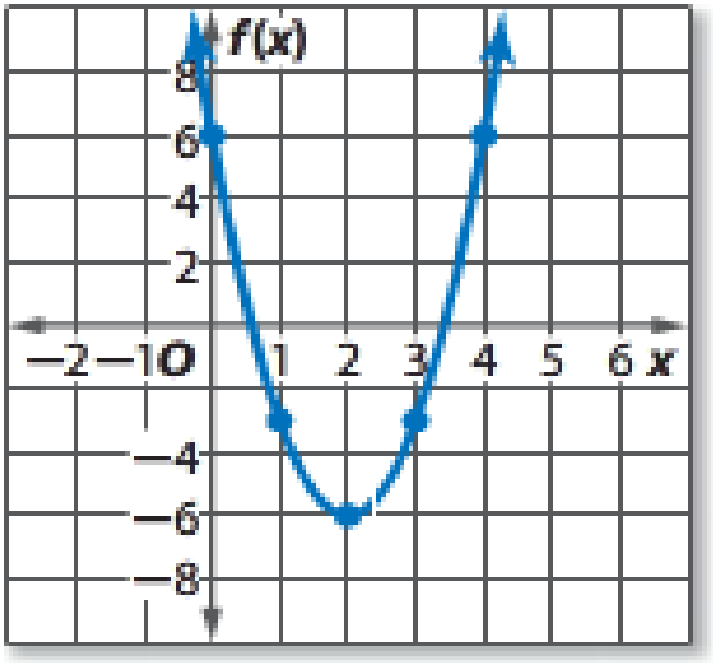
* Identify and write the roots/zeros of a quadratic function.

* Solve quadratic equations by factoring using
    * GCF
    * Box or X method

Standard Form of Quadratic Function

$$f(x) = ax^2 + bx + c, \text{ where } a \neq 0$$

quadratic term | linear term | constant term

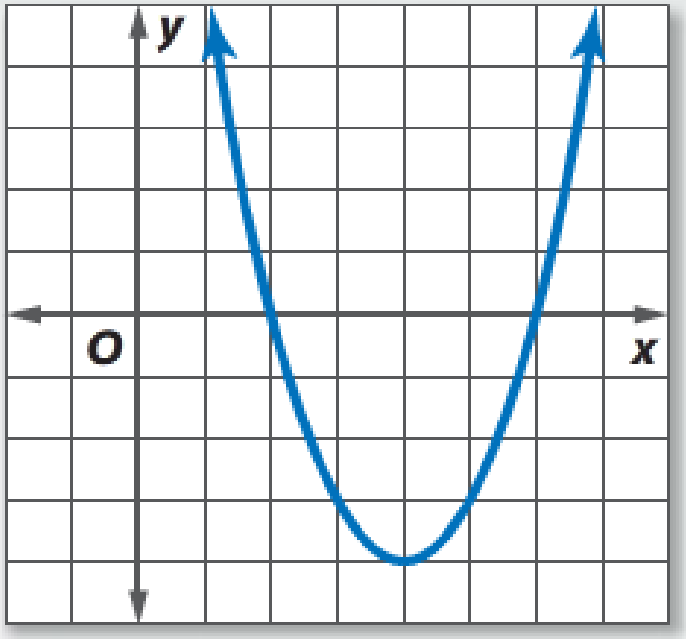


Example 1

Standard Form

$$0 = x^2 - 8x + 12$$

Solve by graphing!



Related Graph
2 and 6 are
x-intercepts.

Factored Form

$$0 = (x - 6)(x - 2)$$

Factors

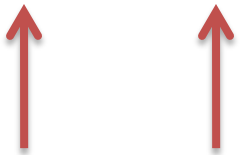
LT 3.5 New Glossary: Factored Form

GRoWTh	Factored Form
Graph	
Rule	
o	
Words	* Solving quadratic functions by factoring is an application of the zero product property. EX: $(x+3)(x+5)=0$
Table	
h	

Factored form

Factored form of a quadratic equation

$$0 = a(x - p)(x - q)$$



p & q Represent the x-intercepts of the graph of the equation

Remember: the x-intercepts are the zeros

Example 2

Solve for the roots/zeros of the equation

a) $(x-3)(x-6) = 0$

b) $(x-2)(x+1) = 0$

c) $(x+5)(x+1) = 0$

Example 3

Write a quadratic equation in factored form and standard form with 4 and -5 as its roots.

First: What are the roots of a quadratic?

Second: What does factored form look like?

Third: What does standard form look like?

Example 4
Translate sentences into Equations

Write a quadratic equation, in factored form and in standard form with – 1/3 and 6 as its roots.

First: What are the roots of a quadratic?

Second: What does factored form look like?

Third: What does standard form look like?

Example 5

What do they have in common!

Solve by factoring

$$16x^2 + 8x = 0.$$

Example 6

Solve by factoring

$$4y^2 + 16y = 0$$

Example 7

Solve by factoring

$$6a^5 + 18a^4 = 0$$

Example 8

Solve by factoring

$$x^2 + 16x + 64 = 0$$

Example 9

Solve by factoring

$$x^2 + 9x + 20 = 0$$

Example 10

Solve by factoring

$$x^2 - 11x + 30 = 0$$

Example 11

Solve by factoring

$$x^2 - 4x - 21 = 0$$

Example 12

Solve by factoring

$$6x^2 + 18x + 12 = 0$$

Example 13

Solve by factoring

$$3x^2 - 6x - 24 = 0$$

Warm-up

HW Check

LT 3.5 **Solving by factoring**	**LT 3.6** **Solving by factoring**
1. Solve quadratic equations. f(x) = ax ^2 + bx +c BY Factoring GCF Box Method or X Method Both	1. Solve quadratic equations. f(x) = ax ^2 + bx +c BY Factoring using Difference of squares Perfect squares

Difference of squares

$$(a+b)(a-b)=a^2-b^2$$

Example 1:

Solve. $x^2 - 64 = 0$

Example 2

Solve by factoring.

$$x^2 - 16 = 0$$

Example 3

Solve by factoring.

$$81x^2 - 9 = 0$$

Example 4

Solve by factoring.

$$3x^2 - 12 = 0$$

Perfect Square

$$a^2 + 2ab + b^2 = (a + b)^2$$

$$a^2 - 2ab + b^2 = (a - b)^2$$

Example 1

Solve each equation by factoring.

$$x^2 + 16x + 64 = 0$$

Example 2

Solve each equation by factoring.

$$x^2 + 12x + 36 = 0$$

Example 3

Solve the following by factoring

$$x^2 - 6xy + 9y^2 = 0$$