

Essential Question 3/1/2021

- How can I factor a quadratic trinomial with a lead coefficient of 1?

Learning Target



Factor Quadratic Trinomials when $A = 1$

Sharing Learning Target:

Where are we coming from?

Solving linear equations: $4x - 5 = 8x - 25$

Where we are going:

Solving Quadratic Equations:

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

$$x^2 + 4x - 32 = 0$$

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

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

$$3x^2 + 4x + 2 = 0$$

Use factoring and non-factoring methods

After completion of this unit, you will be able to...

Learning Target #1: Factoring

- Factor the GCF out of a polynomial
- Factor a polynomial when $a = 1$
- Factor a polynomial when $a \neq 1$
- Factor special products (difference of two squares)

Learning Target #2: Solving by Factoring Methods

- Solve a quadratic equation by factoring a GCF.
- Solve a quadratic equation by factoring when a is not 1.
- Create a quadratic equation given a graph or the zeros of a function.

Learning Target #3: Solving by Non Factoring Methods

- Solve a quadratic equation by finding square roots.
- Solve a quadratic equation by completing the square.
- Solve a quadratic equation by using the Quadratic Formula.

Learning Target #4: Solving Quadratic Equations

- Solve a quadratic equation by analyzing the equation and determining the best method for solving.
- Solve quadratic applications

Let's Recall What We learned in Unit 1

Multiply these two Binomials

$$(x + 3)(x + 4)$$

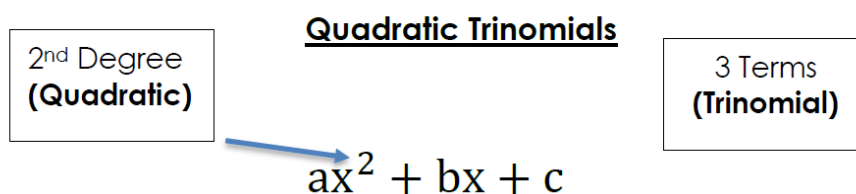
	x	$+3$	
x	x^2	$3x$	
$+4$	$4x$	12	

$x^2 + 7x + 12$

What is Factoring a Trinomial?

Standard(s):

MGSE9–12.A.SSE.3a Factor any quadratic expression to reveal the zeros of the function defined by the expression.



Factoring a trinomial means finding two binomials that when multiplied together produce the given **trinomial**.

Goal: Factor a trinomial into 2
binomials $(\quad)(\quad)$

Skill Preview: "Big X" Problems

Complete the diamond problems. The top cell contains the product of the numbers in the left and right cells, while the bottom cell contains the sum.

(1)	$\begin{array}{c} \diagup -96 \diagdown \\ +12 \quad -8 \\ \diagdown 4 \diagup \end{array}$	(2)	$\begin{array}{c} \diagup -108 \diagdown \\ 9 \quad -12 \\ \diagdown -3 \diagup \end{array}$	(3)	$\begin{array}{c} \diagup -72 \diagdown \\ 6 \quad -12 \\ \diagdown -6 \diagup \end{array}$	(4)	$\begin{array}{c} \diagup -25 \diagdown \\ 5 \quad -5 \\ \diagdown 0 \diagup \end{array}$
(5)	$\begin{array}{c} \diagup -110 \diagdown \\ 10 \quad -11 \\ \diagdown -1 \diagup \end{array}$	(6)	$\begin{array}{c} \diagup -63 \diagdown \\ 9 \quad -7 \\ \diagdown 2 \diagup \end{array}$	(7)	$\begin{array}{c} \diagup 48 \diagdown \\ 6 \quad 8 \\ \diagdown 14 \diagup \end{array}$	(8)	$\begin{array}{c} \diagup -24 \diagdown \\ 6 \quad -4 \\ \diagdown 2 \diagup \end{array}$
(9)	$\begin{array}{c} \diagup -32 \diagdown \\ 4 \quad -8 \\ \diagdown -4 \diagup \end{array}$	(10)	$\begin{array}{c} \diagup -48 \diagdown \\ 12 \quad -4 \\ \diagdown 8 \diagup \end{array}$	(11)	$\begin{array}{c} \diagup -24 \diagdown \\ 4 \quad -6 \\ \diagdown -2 \diagup \end{array}$	(12)	$\begin{array}{c} \diagup -70 \diagdown \\ 7 \quad -10 \\ \diagdown -3 \diagup \end{array}$

Factoring Quadratic Trinomials when a = 1

Steps for Factoring when a = 1

Step 1: ALWAYS check to see if you can factor out a GCF

Step 2: Draw parentheses for the binomial factors and fill in the variables. Ex (x) (x)

Step 3: Complete a "Big X" and T-chart

Step 4: Determine what two numbers can be multiplied to get your "a·c" term and added to get your "b" term. (Use a factor T-chart)

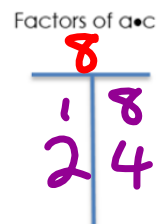
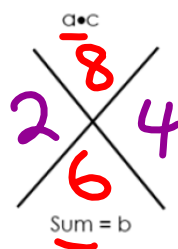
Step 5: Fill the factors in the parentheses.

$$\underline{a}x + bx + \underline{c}$$

Example: Factor the trinomial. *1 do*

a. $x^2 + 6x + 8$

factored form: $(x+2)(x+4)$



We do

Factor the following trinomial

b. $X^2 + 4x - 32$

a•c

Sum = b

Factors of a•c

	-32
1	-32
-2	16
-4	8

Factored Form: $(x-4)(x+8)$

Practice Factoring $A = 1$ - You do

c. Factor $x^2 - 3x - 18$

$$\begin{array}{r} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \begin{array}{c} -18 \\ 3 \\ -6 \\ -3 \end{array}$$

$$\begin{array}{r|l} -18 & \\ \hline -1 & 18 \\ -2 & 9 \\ 3 & -6 \end{array}$$

$$(x+3)(x-6)$$

Practice Factoring $A = 1$ - You do

d. Factor $x^2 - 36$

$$C = -36 \quad b = 0$$

~~$$\begin{array}{cc} & -36 \\ 6 & & -6 \\ & 0 & \end{array}$$~~

$$\begin{array}{r|l} & -36 \\ \hline 1 & 36 \\ 2 & 18 \\ 3 & 12 \\ 4 & 9 \\ 6 & -6 \end{array}$$

$$(x+6)(x-6)$$

Practice Factoring $A = 1$ - You do

e. Factor $\underline{2x^2 + 16x + 24}$ $GCF = 2$

$$\underline{2(x^2 + 8x + 12)}$$

$$\begin{array}{ccc} & 12 & \\ 2 & & 6 \\ & 8 & \end{array}$$

12	
1	12
2	6
3	4

Remember: You must ALWAYS include the GCF on the outside of the factored form!

$$2(x+2)(x+6)$$

Post-It
Check!!!

$$x^2 + 5x + 6$$

A diagram showing the numbers 6, 2, 3, and 5 arranged in a square with two diagonal lines crossing in the center. The numbers 6 and 5 are green, while 2 and 3 are blue.

A diagram showing the numbers 6, 1, 6, 2, and 3 arranged in a square with a vertical line and a horizontal line. The numbers 6, 1, 6, 2, and 3 are green, while the horizontal line and the circle around 2 and 3 are blue.

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

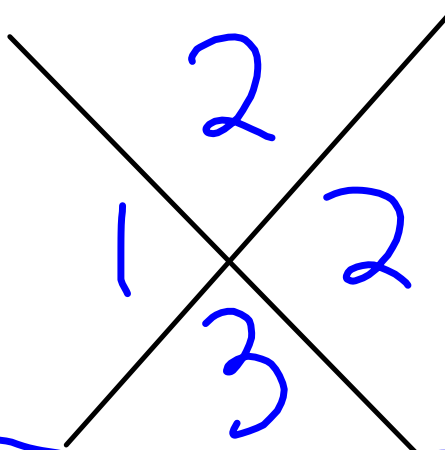


Post-It
Check!!!

$$\frac{4x^3 + 12x^2 + 8x}{4x}$$

$$\text{GCF} = 4x$$

$$4x(x^2 + 3x + 2)$$


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

Remember...your factored form should always be equivalent to the polynomial you started with so you must always include the GCF on the outside of the factored form.

Attachments

Functions notation.ppt

Functions Practice HW.docx

Functions notation notes.ppt