Warm Up

Use the Distribute Property to determine each product.

1. $(x + 1)(x + 2)$

2. $(x + 4)(x - 5)$

3. $(2x - 3)(x - 4)$

4. $(x + 2)^2$

Worked Example

Consider the polynomial $3x + 15$. You can factor out the greatest common factor of the two terms, 3.

$$3x + 15 = 3x + 3(5)$$

$$= 3(x + 5)$$

$$3x + 15 = 3(x + 5)$$

1. Factor out the greatest common factor for each polynomial, if possible.

a. $4x + 12$

b. $x^2 - 5x$

c. $3x^2 - 9x - 3$

d. $-x - 7$

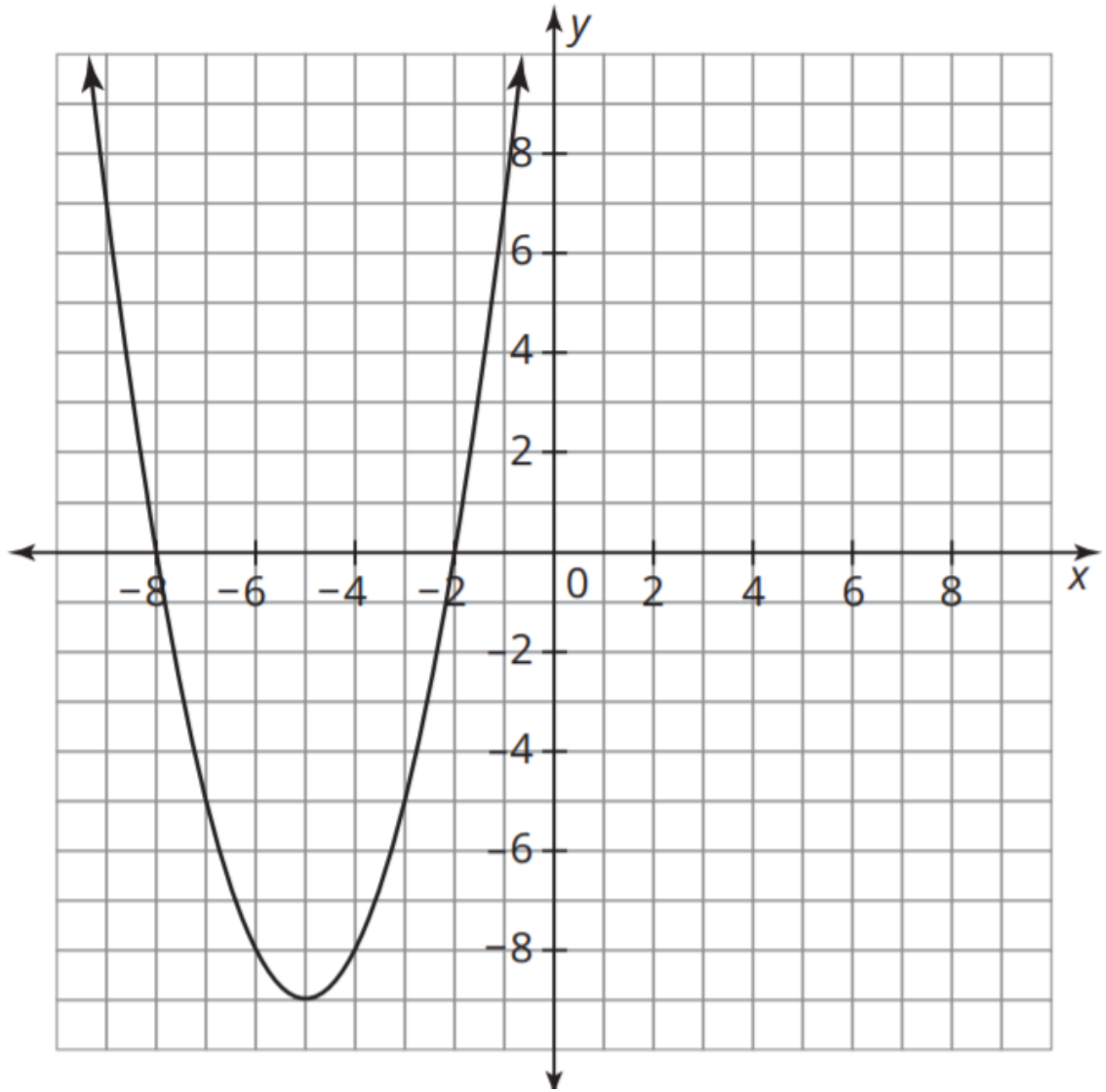
e. $2x - 11$

f. $5x^2 - 10x + 5$

1. **Consider the equation $y = x^2 + 10x + 16$.**

   a. **Use the graph to identify the roots of the equation.**

   b. **Rewrite the original equation in factored form.**



Worked Example

Factor the trinomial $x^2 + 10x + 16$.

Start by writing the leading term (x^2) and the constant term (16) in the table.

·		
	x^2	
		16

Determine the two factors of the leading term and write them in the table.

·	***x***	
x	x^2	
		16

3. Use the worked example to factor each trinomial.

a. $x^2 + 17x + 16$

·		
	x^2	
		16

b. $x^2 + 6x - 16$

·		
	x^2	
		−16

c. $x^2 - 6x - 16$

·		
	x^2	
		−16

4. Factor each trinomial.

a. $x^2 + 5x - 24$

b. $x^2 - 3x - 28$

5. Consider the two examples shown.

Xavier

$2x^2 - 3x - 5$

·	x	1
2x	$2x^2$	2x
-5	-5x	-5

$2x^2 - 3x - 5 = (2x - 5)(x + 1)$

Elinor

$2x^2 + 3x - 5$

·	x	-1
2x	$2x^2$	-2x
5	5x	-5

$2x^2 + 3x - 5 = (2x + 5)(x - 1)$

a. Compare the two given trinomials. What is the same and what is different about the values of *a*, *b*, and *c*?

6. Choose from the list to write the correct factored form for each trinomial.

a. $x^2 + 5x + 4 =$ _____

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

$x^2 + 3x - 4 =$ _____

$x^2 - 3x - 4 =$ _____

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

b. $2x^2 + 7x + 3 =$ _____

$2x^2 - 7x + 3 =$ _____

$2x^2 + 5x - 3 =$ _____

$2x^2 - 5x - 3 =$ _____

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

c. $x^2 + 7x + 10 =$ _____

$x^2 - 7x + 10 =$ _____

$x^2 + 3x - 10 =$ _____

$x^2 - 3x - 10 =$ _____

- $(x - 2)(x + 5)$
- $(x + 2)(x + 5)$
- $(x - 2)(x - 5)$
- $(x + 2)(x - 5)$

8. Factor each quadratic expression.

a. $x^2 + 8x + 15 =$ _____

$x^2 - 8x + 15 =$ _____

$x^2 + 2x - 15 =$ _____

$x^2 - 2x - 15 =$ _____

b. $x^2 + 10x + 24 =$ _____

$x^2 - 10x + 24 =$ _____

$x^2 + 2x - 24 =$ _____

$x^2 - 2x - 24 =$ _____

9. Grace, Elaine, and Maggie were asked to factor the trinomial $15 + 2x - x^2$.

Grace

$15 + 2x - x^2$

$(5 - x)(3 + x)$

Elaine

$15 + 2x - x^2$

$(5 - x)(3 + x)$

$(x - 5)(x + 3)$

Maggie

$15 + 2x - x^2$

$-x^2 + 2x + 15$

$-(x^2 - 2x - 15)$

$-(x - 5)(x + 3)$

Who's correct? Explain how that student(s) determined the factors. For the student(s) who is not correct, state why and make the correction.