

Factor the polynomial using the GCF.

1.  $5x^2 - 5x - 5$

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

3.  $4z^2 - 96z - 8$

4.  $81y^2 + 36y - 3$

5.  $7x^2y + 10xy + 11y$

6.  $15t^2 - 45t + 90$

Warm Up

Write an equation in slope-intercept form of the line that passes through the given points.

1.  $(8, 1), (3, 11)$

2.  $(7, -2), (4, -8)$

Cumulative Warm Up

### Essential Question

How can you use algebra tiles to factor the trinomial  $ax^2 + bx + c$  into the product of two binomials?

Essential Question

• GCF: greatest common factor

• review - practice

Slope formula

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

either

$$y = mx + b \quad y - y_1 = m(x - x_1)$$

What you will learn

• factor  $ax^2 + bx + c$

• use factoring to solve real-life problems.

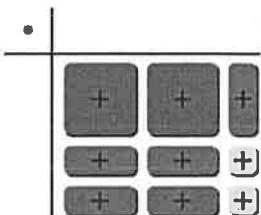
## Chapter 7 Section 6 Notes

BI A1

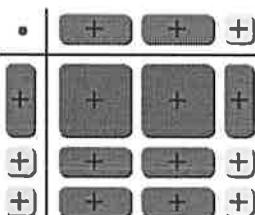
Work with a partner. Use algebra tiles to write each polynomial as the product of two binomials. Check your answer by multiplying.

Sample  $2x^2 + 5x + 2$

Step 1 Arrange algebra tiles that model  $2x^2 + 5x + 2$  into a rectangular array.



Step 2 Use additional algebra tiles to model the dimensions of the rectangle.



Exploration 1 Steps 1-2

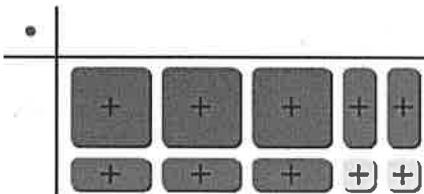
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Step 3 Write the polynomial in factored form using the dimensions of the rectangle.

width      length

$$\text{Area} = 2x^2 + 5x + 2 = (x + 2)(2x + 1)$$

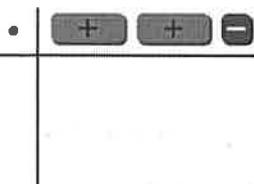
a.  $3x^2 + 5x + 2 =$



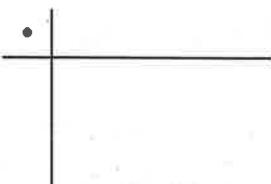
Exploration 1 Step 3a

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b.  $4x^2 + 4x - 3 =$



c.  $2x^2 - 11x + 5 =$



Exploration 1 Step 3b-c

Skip

## Chapter 7 Section 6 Notes

Bl A1

Factor  $5x^2 + 15x + 10$ .

$$\begin{array}{r} 5(x^2 + 3x + 2) \\ \hline 2 \cdot 1 \\ 1 \cdot 2 \end{array}$$

$$5(x^2 + 1x) + (2x + 2)$$

$$5(x(x+1)) + 2(x+1)$$

$$5(x+1)(x+2)$$

Example 1

- Factor GCF first
- Use AC method

Factor each polynomial.

a.  $4x^2 + 13x + 3$

$$(4x^2 + 12)x + (1x + 3)$$

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

$$\begin{array}{r} 12 \\ \hline 2 \cdot 6 \\ 3 \cdot 4 \end{array}$$

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

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

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

$$\begin{array}{r} 6 \\ \hline 1 \cdot 6 \\ 2 \cdot 3 \end{array}$$

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

Example 2

AC method

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

Factor  $2x^2 - 5x - 7$ .

$$(2x^2 + 2x) - (7x + 7)$$

$$2x(x+1) - 7(x+1)$$

$$\begin{array}{r} 14 \\ \hline +1 - 14 \\ +2 - 7 \end{array}$$

$$(x+1)(2x-7)$$

Example 3

Student practice

Factor  $-4x^2 - 8x + 5$ .

$$-1(4x^2 + 8x - 5)$$

$$\begin{array}{r} 20 \\ -1 \quad + 20 \\ -2 \quad + 10 \\ -4 \quad + 5 \end{array}$$

$$-1[(4x^2 - 2x) + (10x - 5)]$$

$$-1[2x(2x - 1) + 5(x - 1)]$$

$$-1(2x - 1)(2x + 5)$$

Example 4

Factor the polynomial.

1.  $8x^2 - 56x + 48$     2.  $14x^2 + 31x + 15$     3.  $2x^2 - 7x + 5$

4.  $3x^2 - 14x + 8$     5.  $4x^2 - 19x - 5$     6.  $6x^2 + x - 12$

7.  $-2y^2 - 5y - 3$     8.  $-5m^2 + 6m - 1$     9.  $-3x^2 - x + 2$

Monitoring Progress 1-9

The length of a rectangular game reserve is 1 mile longer than twice the width. The area of the reserve is 55 square miles. What is the width of the reserve?

Example 5

When leading coefficient is a negative 1 factor out the negative first so LC is positive

\*Student practice

## Chapter 7 Section 6 Notes

BI A1

10. WHAT IF? The area of the reserve is 136 square miles. How wide is the reserve?

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Monitoring Progress 10

- Exit Ticket: Factor  $2x^2 - 7x + 3$ .

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Closure

