

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Bellwork!**

1. Which of the following sets of values cannot be modeled with a quadratic function?

(A)  $(2, 3), (0, -1), (3, 2)$

(C)  $(2, -7), (-1, 5), (3, -11)$

(B)  $f(2) = 7, f(-1) = -2, f(0) = 3$

(D)  $f(2) = -6, f(0) = -2, f(-1) = 3$

## AGENDA

**Bellwork:**

**Homework Review:**

**Lesson:** Factoring Quadratic Expressions

- Lesson Vocabulary**
- factoring
  - greatest common factor (GCF) of an expression
  - perfect square trinomial
  - difference of two squares

**Objective:** To find common and binomial factors of quadratic and special quadratic expressions.

**Essential Understanding** You can factor many quadratic trinomials  $(ax^2 + bx + c)$  into products of two binomials.

**Problem 1** Factoring  $ax^2 + bx + c$  when  $a = \pm 1$

**Problem 2** Finding Common Factors

**Problem 3** Factoring  $ax^2 + bx + c$  when  $|a| \neq 1$

**Problem 4** Factoring a Perfect Square Trinomial

**Problem 5** Factoring a Difference of Two Squares

**Teacher Directed:** Problems 1, 2, 3, 4, 5

**Student Centered:** Lesson Quiz

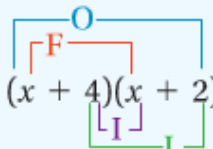
**Homework:** Problem Set G “select problems”

## 4-4

## Factoring Quadratic Expressions

You can use the Distributive Property or the FOIL method to multiply two binomials. You can use FOIL in reverse to help you factor.

$$\begin{aligned}(x + 4)(x + 2) &= (x + 4)(x) + (x + 4)(2) && \text{Use the Distributive Property.} \\ &= x(x) + 4(x) + x(2) + 4(2) \\ &= x^2 + 6x + 8\end{aligned}$$



$$\begin{aligned}(x + 4)(x + 2) &= x(x) + x(2) + 4(x) + 4(2) && \text{F: First; O: Outer; I: Inner; L: Last} \\ &= x^2 + 6x + 8\end{aligned}$$

To factor  $x^2 + 6x + 8$ , think of FOIL in reverse. Find two binomials for which the first terms have the product  $x^2$ , the products of the outer and inner terms have the sum  $6x$ , and the last terms have the product  $8$ .

$$x^2 + 6x + 8 = (x + 4)(x + 2)$$

### Problem 1 Factoring $ax^2 + bx + c$ when $a = \pm 1$

What is the expression in factored form?

**A**  $x^2 + 9x + 20$

**B**  $x^2 + 14x - 72$

**C**  $-x^2 + 13x - 12$

**Got It?** 1. What is the expression in factored form?

a.  $x^2 + 14x + 40$

b.  $x^2 - 11x + 30$

c.  $-x^2 + 14x + 32$

### Problem 2 Finding Common Factors

What is the expression in factored form?

**A**  $6n^2 + 9n$

**B**  $4x^2 + 20x - 56$

**Got It?** 2. What is the expression in factored form?

a.  $7n^2 - 21$

b.  $9x^2 + 9x - 18$

c.  $4x^2 + 8x + 12$

**Problem 3** Factoring  $ax^2 + bx + c$  when  $|a| \neq 1$

What is the expression in factored form?

**A**  $2x^2 + 11x + 12$

**B**  $4x^2 - 4x - 3$

**Got It?** 3. What is the expression in factored form? Check your answers.

a.  $4x^2 + 7x + 3$

b.  $2x^2 - 7x + 6$

**Key Concept** Factoring Perfect Square Trinomials

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

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

**Problem 4** Factoring a Perfect Square Trinomial

What is  $4x^2 - 24x + 36$  in factored form?

**Got It?** 4. What is  $64x^2 - 16x + 1$  in factored form?

**Key Concept** Factoring a Difference of Two Squares

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

**Problem 5** Factoring a Difference of Two Squares

What is  $25x^2 - 49$  in factored form?

**Got It?** 5. What is  $16x^2 - 81$  in factored form?

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## 4-4 Lesson Quiz

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1. Do you UNDERSTAND? What is the expression in factored form?  $x^2 + 7x + 10$
  
  
  
  
  
  
  
  
  
  
2. What is the expression in factored form?  $3x^2 + 21x + 18$
  
  
  
  
  
  
  
  
  
  
3. What is the expression in factored form?  $3x^2 + 4x - 15$
  
  
  
  
  
  
  
  
  
  
4. What is  $x^2 - 14x + 49$  in factored form?
  
  
  
  
  
  
  
  
  
  
5. What is  $16x^2 - 25$  in factored form?