

## Factoring Expressions Worksheet Answer Key PDF

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### Part 1: Building a Foundation

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**What is the primary purpose of factoring an algebraic expression?**

undefined. **A) To simplify the expression for easier computation ✓**

undefined. B) To make the expression more complex

undefined. C) To change the variables in the expression

undefined. D) To eliminate all constants

The primary purpose of factoring is to simplify the expression for easier computation.

**Which of the following are common techniques used in factoring expressions?**

undefined. **A) Factoring out the greatest common factor (GCF) ✓**

undefined. **B) Completing the square ✓**

undefined. **C) Factoring by grouping ✓**

undefined. D) Solving by substitution

Common techniques include factoring out the GCF, completing the square, and factoring by grouping.

**Explain what a polynomial expression is and provide an example.**

**A polynomial expression is a mathematical expression involving a sum of powers in one or more variables multiplied by coefficients. An example is  $2x^2 + 3x + 1$ .**

### Part 2: Comprehension and Interpretation

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**When factoring the expression  $x^2 - 9$ , which technique is most appropriate?**

undefined. A) Factoring by grouping

**undefined. B) Difference of squares ✓**

undefined. C) Perfect square trinomial

undefined. D) Completing the square

The most appropriate technique is the difference of squares.

**Which of the following expressions can be factored using the difference of squares method?**

**undefined. A)  $x^2 - 16$  ✓**

undefined. B)  $x^2 + 4x + 4$

**undefined. C)  $9x^2 - 25$  ✓**

undefined. D)  $x^2 + 9$

Expressions that can be factored using the difference of squares include  $x^2 - 16$  and  $9x^2 - 25$ .

**Describe how you would factor the expression  $3x^2 + 6x$ .**

**To factor  $3x^2 + 6x$ , you would factor out the greatest common factor, which is  $3x$ , resulting in  $3x(x + 2)$ .**

### Part 3: Application and Analysis

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**If you have factored an expression as  $(x + 3)(x - 2)$ , what was the original quadratic expression?**

**undefined. A)  $x^2 + x - 6$  ✓**

undefined. B)  $x^2 - x - 6$

undefined. C)  $x^2 + 5x + 6$

undefined. D)  $x^2 - 5x + 6$

The original quadratic expression is  $x^2 + x - 6$ .

**Which of the following expressions can be factored by first factoring out the GCF?**

**undefined. A)  $4x^2 + 8x$  ✓**

undefined. B)  $x^2 + 5x + 6$

**undefined. C)  $2x^3 - 4x^2 + 6x$  ✓**

undefined. D)  $x^2 - 4$

Expressions that can be factored by first factoring out the GCF include  $4x^2 + 8x$  and  $2x^3 - 4x^2 + 6x$ .

**Factor the expression  $x^2 + 5x + 6$  and explain each step.**

**To factor  $x^2 + 5x + 6$ , find two numbers that multiply to 6 and add to 5, which are 2 and 3. Thus, it factors to  $(x + 2)(x + 3)$ .**

## Part 4: Evaluation and Creation

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**Which of the following expressions is fully factored?**

undefined. A)  $x^2 - 4x + 4$

**undefined. B)  $(x + 2)(x - 2)$  ✓**

undefined. C)  $x(x + 3)$

undefined. D)  $2(x^2 + 3x + 2)$

The expression  $(x + 2)(x - 2)$  is fully factored.

**Evaluate which expressions can be factored further:**

**undefined. A)  $x^2 + 2x + 1$  ✓**

undefined. B)  $3x(x + 1)$

**undefined. C)  $x^2 - 1$  ✓**

undefined. D)  $x^2 + 4$

Expressions that can be factored further include  $x^2 + 2x + 1$  and  $x^2 - 1$ .

**Create a real-world scenario where factoring a quadratic expression would be necessary. Describe the situation and how factoring would be applied.**

**A real-world scenario could involve finding the dimensions of a rectangular garden where the area is represented by a quadratic expression. Factoring would help determine the length and width.**