

Factoring Polynomials Worksheet

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Part 1: Building a Foundation

What is the process of breaking down a polynomial into simpler polynomials called?

Hint: Think about the opposite of expanding.

- A) Expanding
- B) Factoring
- C) Simplifying
- D) Distributing

What is the process of breaking down a polynomial into simpler polynomials called?

Hint: Think about the method used to simplify expressions.

- A) Expanding
- B) Factoring
- C) Simplifying
- D) Distributing

Which of the following are types of polynomials? (Select all that apply)

Hint: Consider the different classifications of polynomials based on the number of terms.

- A) Monomial
- B) Binomial
- C) Trinomial
- D) Quadrinomial

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Explain what a Greatest Common Factor (GCF) is in the context of factoring polynomials.

Hint: Think about the largest factor that divides all terms.

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List the special factoring formulas you know, such as the difference of squares.

Hint: Consider common identities used in factoring.

1. What is the difference of squares?

2. What is a perfect square trinomial?

3. What is the sum of cubes?

Part 2: Comprehension and Application

Which of the following expressions can be factored using the difference of squares formula? (Select all that apply)

Hint: Identify expressions that fit the form $a^2 - b^2$.

- A) $x^2 - 9$
- B) $x^2 + 4x + 4$
- C) $4x^2 - 16$
- D) $x^2 + 1$

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Describe the process of factoring by grouping and when it is typically used.

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Hint: Think about how to group terms to simplify factoring.

What is the factored form of $x^2 + 5x + 6$?

Hint: Look for two numbers that multiply to 6 and add to 5.

- A) $(x + 2)(x + 3)$
 B) $(x + 1)(x + 6)$
 C) $(x + 2)(x + 4)$
 D) $(x + 3)(x + 3)$

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Which of the following polynomials can be factored by taking out a GCF? (Select all that apply)

Hint: Look for polynomials with common factors in all terms.

- A) $3x^2 + 6x$
 B) $x^2 + 4x + 4$
 C) $5x^3 - 10x^2$
 D) $x^2 - 1$

Which of the following polynomials can be factored by taking out a GCF? (Select all that apply)

Hint: Identify polynomials that share a common factor.

- A) $3x^2 + 6x$
 B) $x^2 + 4x + 4$
 C) $5x^3 - 10x^2$
 D) $x^2 - 1$

Factor the polynomial $2x^3 + 4x^2 - 6x$ completely.

Hint: Look for a common factor in all terms.

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Part 3: Analysis, Evaluation, and Creation

Which of the following statements is true about the polynomial $x^2 - 4x + 4$?

Hint: Consider the characteristics of the polynomial.

- A) It is a difference of squares.
- B) It is a perfect square trinomial.
- C) It cannot be factored.
- D) It is a sum of cubes.

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Consider the polynomial $x^3 - 3x^2 - 4x + 12$. Which of the following are possible first steps in factoring this polynomial? (Select all that apply)

Hint: Think about different factoring techniques.

- A) Factor by grouping
- B) Use the difference of squares
- C) Take out a GCF
- D) Use the sum of cubes

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Analyze the polynomial $x^4 - 16$ and explain how it can be factored completely.

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Which of the following factored forms is correct for the polynomial $x^3 + 3x^2 - 4x - 12$?

Hint: Look for common factors and possible roots.

- A) $(x + 3)(x^2 - 4)$
- B) $(x - 3)(x^2 + 4)$
- C) $(x + 3)(x - 2)(x + 2)$
- D) $(x - 3)(x + 2)(x - 2)$

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Evaluate the following statements about factoring and select the true ones. (Select all that apply)

Hint: Consider the properties of polynomials.

- A) Every polynomial can be factored into linear factors.
- B) Factoring is the reverse process of expanding.
- C) A polynomial with no real roots cannot be factored.
- D) Factoring is useful for solving polynomial equations.

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Create a polynomial that can be factored using both the difference of squares and factoring by grouping. Provide the polynomial and its factored form.

Hint: Think of a polynomial that has both characteristics.

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