Title Page

Factoring Differences of Squares

I can factor binomials that are the differences of squares.

TEKs

10.E - Factor, if possible, trinomials with real factors in the form $ax^2 + bx + c$, including perfect square trinomials of degree two

10.F - Decide if a binomial can be written as the difference of two squares and, if possible, use the structure of a difference of two squares to rewrite the binomial.

Warm Up

1. \{1/2, ¾\}  
2. \{-1, 5/3\}  
3. \{-1/2, 7\}  
4. \{1, -3/4\}  
5. \{-2/3, 5\}  
6. \{-2/3, 5/2\}  
7. \{-8, 5/2\}  
8. \{-5/2, -8\}  
9. \{7/3, -1/3\}  
10. \{-3/2, 5/6\}  
11. \{-2/7, -9\}  
12. \{1/2, 3/8\}  
13. \{3/4, -1/2\}  
14. \{-12, 5\}  
15. \{7/3, 7\}  
16. 6 in x 4 in

Math Humor

Old mathematicians never die
they just lose some of their functions

Homework Answers

Math Humor

Maintain Your Skills

1. D
2. A

Practice Worksheet

Introduction
### Introduction

- Ten squared is 100, so the square root of 100 is ____?
- 13 x 13 = 169, so the square root of 169 is ____?
- a x a = a², so the square root of a² is ____?
- 3b² x 3b² = 9b⁴, so the square root of 9b⁴ is ____?

### Notes

#### 1. What is a perfect square?
- a rational #
- square root is also rational #
- 4t² is a perfect square, it’s square root is 2t

#### 2. What is a difference of squares?
- two perfect squares separated by subtraction (a² - b²)
- can be factored (a² - b²) = (a+b)(a-b)
- 4x² - q
- (2x)² - 3²

#### 3. What is a sum of squares?
- two perfect squares separated by addition (a² + b²)
- can not be factored prime polynomial!

#### 4. How to factor a difference of squares?
- a² - b² = (a+b)(a-b)
- factor out GCF first!
- may need to factor difference of squares more than once
- FOIL to check

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Find a friend and tell them what difference of squares and sum of squares is.

*Best friends forever*
Would You Rather?

Jump into a pool of piranhas... OR a pit of rattlesnakes?

Examples

1. Factor
   a. \((m^2 - 49)\)
   \((m+7)(m-7)\)
   b. \((a^2 - 4b^2)\)
   \((a + 2b)(a-2b)\)

2. Factor (remove the GCF first)
   a. \(9x^2 - 36y^2\)
   \(9(x+2y)(x-2y)\)
   b. \(32 - 8y^2\)
   \(8(2+y)(2-y)\)
   c. \(36z^3 - 9z\)
   \(9z(2z+1)(2z - 1)\)

3. Factor (more than once)
   a. \(x^4 - 256\)
   \((x^2+16)(x+4)(x-4)\)
   b. \(2x^4 - 32\)
   \(2(x^2+4)(x+2)(x-2)\)

Application

If a car skids on dry concrete, police can use a formula to approximate the speed \(s\) of a vehicle in miles per hour given the length \(d\) of the skid marks. If the skid marks are 54 feet long, how fast was the car traveling?

\[
\frac{1}{24} s^2 = d
\]

\[
\frac{1}{24} s^2 = 54 \quad \text{(24)}
\]

\[
s^2 = 1296 \quad \text{mph}
\]

\[
s = 36 \quad \text{mph}
\]

Activity

Factors:

- \((x^2-81)\)
- \((x^2-64)\)
- \((x^2-9)\)
- \((x^2-16)\)
- \((x^2-4)\)
- \((x^2-49)\)
- \((x^2-25)\)
- \((x^2-36)\)
Activity

Practice
Factoring a Difference of Squares Worksheet

Closing Questions
What is the square root of $4x^4$? $2x^2$
What is the GCF of $8x^2y$ and $16xy$? $8xy$