

## Solving Quadratic Equations by Factoring 5.2

### 5.2. Solving Quadratic Equations by Factoring

- Warm-up
- Rewrite the following function in standard form

$$y = (x + 3)(x + 5)$$

## Notes

- $(x + 3)(x + 5)$  can be rewritten as  $x^2 + 8x + 15$ .
- The expressions  $(x + 3)$  and  $(x + 5)$  are known as **binomials** because they have two terms.
- $x^2 + 8x + 15$  is a **trinomial** because it has three terms.
- **Factoring** is the process used to write trinomials into binomials.

## What is factoring... Wait what is a factor?

- Function must be set equal to  $f(x)$ ,  $y$  or zero.
- Identify your  $a$ ,  $b$  and  $c$ .
- Break  $a$ , and  $c$ , into possible factors
- Determine the factors of  $a$  and  $c$  that can be used to add or subtract to  $b$ .

Lets try this out

- $f(x) = x^2 + 6x + 5$

Practice

$$f(x) = x^2 - x - 6$$

## Practice

$$x^2 - x = 2$$

$$x^2 + 2x = -1$$

## Practice/Homework

$$5) x^2 - 11x + 19 = -5$$

$$6) n^2 + 7n + 15 = 5$$

$$7) n^2 - 10n + 22 = -2$$

$$8) n^2 + 3n - 12 = 6$$

$$9) 6n^2 - 18n - 18 = 6$$

$$10) 7r^2 - 14r = -7$$

## Factoring Continued 2/11

- Warm-Up
- Factor the following Expressions
  - $x^2 + 3x + 2$
  - $3x^2 + 2x - 5$
  - $x^2 - 7x + 12$

## Special Cases

- Difference of two squares
  - $a^2 - b^2 = (a + b)(a - b)$
  - $x^2 - 9 = (x + 3)(x - 3)$

Example; Factor,

$$x^2 - 16,$$

$$x^2 - 4$$

You try!

- $x^2 - 36$

- $x^2 - 81$

- $x^2 + 49$

Special Case Number 2

- $2x^2 + 4x - 6$

- $2x^2 - 6x - 8$

You try

- $3x^2 - 21x + 18$

- $4x^2 + 6x - 18$

## 5.2 Solving Quadratic equations by factoring 2/12

- Warm Up
  - Factor the following trinomials
    - $3x^2 - 6x - 9$
    - $x^2 - 144$

## Why are we here?

- What do these factored forms mean?

$$x^2 + 3x + 4 = 0$$

## Solving

- $x^2 - 3x - 4 = 0$

- $x^2 - 2x + 1 = 0$

- $x^2 + 6x + 5 = 0$



## Warm-up

- Place old warm-ups in the box
- Start new Warm-ups with,
- Factor the following

$$x^2 - x - 6$$

$$x^2 - 6x + 9$$

$$x^2 + 8x - 16$$

## Notes

- $\sqrt{ab} = \sqrt{a} \cdot \sqrt{b}$

- $\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$

**Solving Quadratic Equations by Factoring**

Review: Factor the following.

1.  $\sqrt{3} \cdot \sqrt{12}$

2.  $\sqrt{12} \cdot \sqrt{2}$

3.  $2\sqrt{7} \cdot \sqrt{7}$

4.  $4\sqrt{3} \cdot \sqrt{21}$

5.  $\sqrt{\frac{1}{9}}$

6.  $\sqrt{\frac{36}{25}}$

7.  $\sqrt{\frac{75}{36}}$

8.  $\sqrt{\frac{3}{16}}$

9.  $\sqrt{\frac{6}{5}}$

10.  $\frac{2}{\sqrt{3}}$

On Your Own!

1.  $\sqrt[7]{8}$

2.  $\sqrt[45]{32}$

After each set of problems, you must get your answers checked before moving on!

All Problems On Page 267

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#21  
#22

#23  
#24  
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#28  
#30  
#32  
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#36  
#38  
#40  
#42  
#44

#46  
#48  
#50

Challenge Yourself!  
#1,2,3