

10.7

DAY 2

Warm Up

Factor the expression.

$$\sqrt{100x^2} - \sqrt{121}$$

$$(10x + 11)(10x - 11) \quad \checkmark$$

(Handwritten purple annotations: a purple oval around the factors, a purple bracket under the middle terms with "110x" and "-110x" written below it.)

$$25n^2 - 20n + 4$$

$$(5n - 2)(5n - 2)$$

(Handwritten green annotations: a green oval around the factors, a green bracket under the middle terms with "-10n" written below it.)

Homework Questions?

$$\begin{aligned}
 & \underline{36} \mid \frac{48y^2}{3} - \frac{72xy}{3} + \frac{27x^2}{3} \\
 & 3(16y^2 - 24xy + 9x^2) \\
 & 3(4y - 3x)(4y - 3x)
 \end{aligned}$$

The final factored form $3(4y - 3x)(4y - 3x)$ is circled in green. Small green arcs connect the $-12xy$ terms from the two binomials to the $-72xy$ term in the original expression.

$$\begin{aligned}
 & \underline{22} \mid 16 - 81r^2 \\
 & (4 + 9r)(4 - 9r)
 \end{aligned}$$

The final factored form $(4 + 9r)(4 - 9r)$ is circled in green.

$$\begin{array}{l} \underline{20)} \quad \frac{6m^2}{6} - \frac{150}{6} \\ \\ 6(m^2 - 25) \end{array}$$

Self Scoring Scale

4- I can *summarize* the concepts and explain it to others.

3- I can *apply* the concepts to answer questions correctly.

2- I can *apply* the concepts but with some *mistakes*.

1- I *need help* to know how to apply the concepts.

0- I *can't* apply the concepts even with help.

10.7 Factoring Special Products

Goals:

- Use special product patterns to factor quadratic polynomials.
- Solve quadratic equations by factoring.

EQ: When factoring, what should you look for?

← Algebra 1.5 →	
② LAST UNIT/Experience Quadratic Equations	① CURRENT UNIT Polynomials & Factoring
③ NEXT UNIT/Experience Rational Equations	
⑧ Student Activities or Assignments 1. 10.1 2. 10.2 3. 10.3 4. 10.4 5. 10.5 6. 10.6 7. 10.7 8. 10.8	⑤ UNIT MAP
⑦ UNIT SELF-TEST QUESTIONS 1. When adding & subtracting polynomials, how do you combine like terms? 2. How do you use distributive property, FOIL, and diagrams to multiply polynomials? 3. What is the method for factoring trinomials? 4. How is factoring & the Zero-Product Property used to solve polynomials?	⑥ UNIT RELATIONSHIPS Factor Solve Calculate Simplify

Example 3: Graphical and Analytical Reasoning

Solve the equation $9x^2 - 25 = 0$.

$$(3x + 5)(3x - 5) = 0$$

$\underbrace{\hspace{1.5cm}}_{15x} \quad \underbrace{\hspace{1.5cm}}_{-15x}$

$$3x + 5 = 0 \qquad 3x - 5 = 0$$

$-5 \quad -5 \qquad \qquad \qquad +5 \quad +5$

$$\frac{3x}{3} = \frac{-5}{3} \qquad \frac{3x}{3} = \frac{5}{3}$$

$$x = -\frac{5}{3} \qquad x = \frac{5}{3}$$

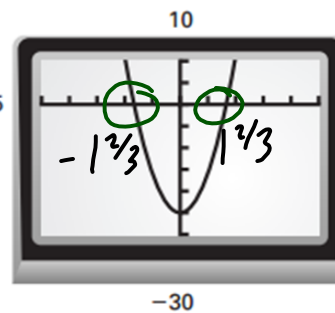
$-1\frac{2}{3} \qquad \qquad \qquad 1\frac{2}{3}$

Check You can check your answer by substitution or by graphing.

$0 = 9\left(-\frac{5}{3}\right)^2 - 25 \quad 25 - 25 = 0 \checkmark$
 $0 = 9\left(\frac{5}{3}\right)^2 - 25 \quad 25 - 25 = 0 \checkmark$

Graph $y = 9x^2 - 25$.

Use your graphing calculator's zero feature to find the x-intercepts, where $9x^2 - 25 = 0$.



Example 4: Solving a Quadratic Equation

Solve $\frac{4}{100}x^2 - \frac{3}{10}x + \frac{9}{16} = 0$.

$$\left(\frac{2}{10}x - \frac{3}{4}\right)\left(\frac{2}{10}x - \frac{3}{4}\right) = 0 \quad \checkmark$$

$\underbrace{\hspace{2cm}}_{-\frac{6}{40}x} \quad \underbrace{\hspace{2cm}}_{-\frac{6}{40}x} = \frac{-12}{40}x = \frac{-3}{10}$

$$\frac{2}{10}x - \frac{3}{4} = 0 \qquad \frac{2}{3}x - \frac{3}{4} = 0$$

$+3/4 \quad +3/4$

$$5 \cdot \frac{1}{5}x = \frac{3}{4} \cdot 5$$

$$x = \frac{15}{4}$$

$$x = \frac{15}{4}$$

Example 5: Using a Quadratic Equation

Vertical Motion - An object is propelled from the ground with an initial upward velocity of 128 feet per second. Will the object reach a height of 256 feet? If it does, how long will it take the object to reach the height?

Solution

Use a vertical motion model where v is 128, s is 0, and h is 256.

$$-16t^2 + vt + s = h$$

2. Solve the equation $\frac{-9x^2}{-1} + \frac{84x}{-1} - \frac{196}{-1} = 0$.

$$-1(a^2 - 84x + 196) = 0$$

$$-1(3x - 14)(3x - 14) = 0$$

-42x -42x

$$3x - 14 = 0$$

+14 +14

$$3x - 14 = 0$$

$$\frac{3x}{3} = \frac{14}{3}$$

$$x = \frac{14}{3}$$

$$x = \frac{14}{3}$$

3. An object is propelled from the ground with an initial upward velocity of 256 feet per second. Will it reach a height of 1024 feet? If it does, how long will it take it to reach the height?

$$5 \left(\frac{-4}{5}x^2 - \frac{4}{5}x - \frac{1}{5} = 0 \right)$$

$$\frac{-4x^2}{-1} - \frac{4x}{-1} - \frac{1}{-1} = 0$$

$$-1(4x^2 + 4x + 1) = 0$$

$$-1(2x + 1)(2x + 1) = 0$$

$$2x + 1 = 0$$

$$\frac{2x}{2} = \frac{-1}{2}$$

$$x = -\frac{1}{2}$$

$$x = -\frac{1}{2}$$

Summary

EQ: How do you solve $m^2 - 4$?

$$(m-2)(m+2)$$

When factoring, what should you look for?

- 1) \div by common factor
- 2) Look for Perfect Squares
(1st & last term)
- 3) No neg. in front of x^2

10.7 Homework (Day 2)

p.622 #6-11, 18-48even, 51-61

& Finish p.615 #48-59