

Date:

Title:

(A) Lesson Objectives:

- a. Present an overview of the different trinomial factorization techniques.
- b. Introduce the Zero Product Property.
- c. Solve quadratic equations in the form of $ax^2 + bx + c = 0$.
- d. Verify the solutions to equations by (i) substitution, (b) data tables, (c) graphs

(B) REVIEW of Factorization Methods:

- a. Identify COMMON FACTORS
- b. If you have TWO (2) terms, is it a DIFFERENCE of SQUARES polynomial $(a^2 - b^2) = (a - b)(a + b)$
- c. If you have a trinomial in the form of $x^2 + bx + c$, then use the sum/product method
 - i. $\rightarrow x^2 + bx + c = (x + M)(x + N)$ where $MN = c$ and $M + N = b$
- d. If you have a trinomial in the form of $ax^2 + bx + c$, then use the grouping method
 - i. \rightarrow find axc and then find the factors of the product ac that add to give b . Then creat the 4 term polynomial and factor by grouping

e. EXAMPLES:

Factor $3x^2 + 3x - 6$

Factor $16x^2 + 48x + 36$

Factor $45x^2 - 20$

(C) Introduction: Zero Product Property

For the following numbers, find find three sets of rational numbers that give the following products.

(a) 12

(b) -24

(c) 0

What observation do you make about the products for (c) as opposed to (a) and (b)?

So, we can then state the ZERO PRODUCT PROPERTY as follows:

Date:

Title:

(D) In Class Practice – Solving Equations

a. What does it mean to SOLVE?

b. Find the values of x that solve each equation.

a) $(x - 5)(x + 1) = 0$

b) $5(x + 3)(x + 4) = 0$

c) $2x(x + 6) = 0$

In question (b), why is it okay to divide by 5 first?

Why, in question (c), can we not divide by x ?

c. Find the values of x that solve each of the following quadratic equations.

(a) $x^2 + 7x + 10 = 0$

(b) $x^2 - 25 = 0$

(c) $3x^2 - 15x = 0$

(d) $5x^2 - 15x - 200 = 0$

(e) $2x^2 - 14x + 20 = 0$

d. We will now check/verify your answers by:

- i. Using STORE on your calculator.
- ii. Substitution
- iii. Data Tables
- iv. Graphs

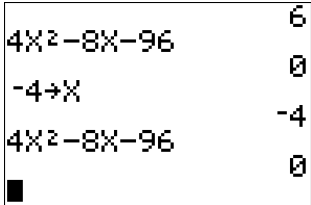
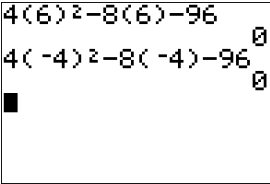
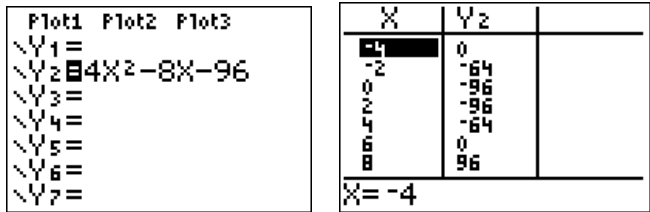
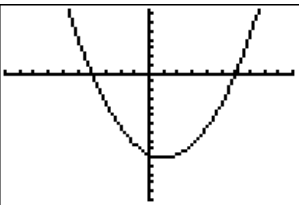
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e. Solve and verify/check $4x^2 - 8x - 96 = 0$

Solution: $4x^2 - 8x - 96 = 4(x^2 - 2x - 24) = 4(x - 6)(x + 4) = 0 \rightarrow x = 6, x = -4$

Verify:

<p>STORE command</p> 	<p>Substitute</p> 
<p>Table of values</p> 	<p>Graph</p> 

f. Solve and verify $4x^2 - 14x + 6 = 0$.

(E) **Classwork** → from <http://www.teacherweb.com/NY/Arlington/AlgebraProject/U6L10TheZeroProductLaw.pdf>

(F) **HW: from Textbook** → Chapter 16C, page 345, Q1adg, Q2adgj, Q3adg, Q4adgj

(G) Video help from OnlineMathLearning with solving quadratic equations:

a. <http://www.onlinemathlearning.com/solve-quadratic-factoring.html>

(H) Reading from PurpleMath

a. <http://www.purplemath.com/modules/solvquad.htm>