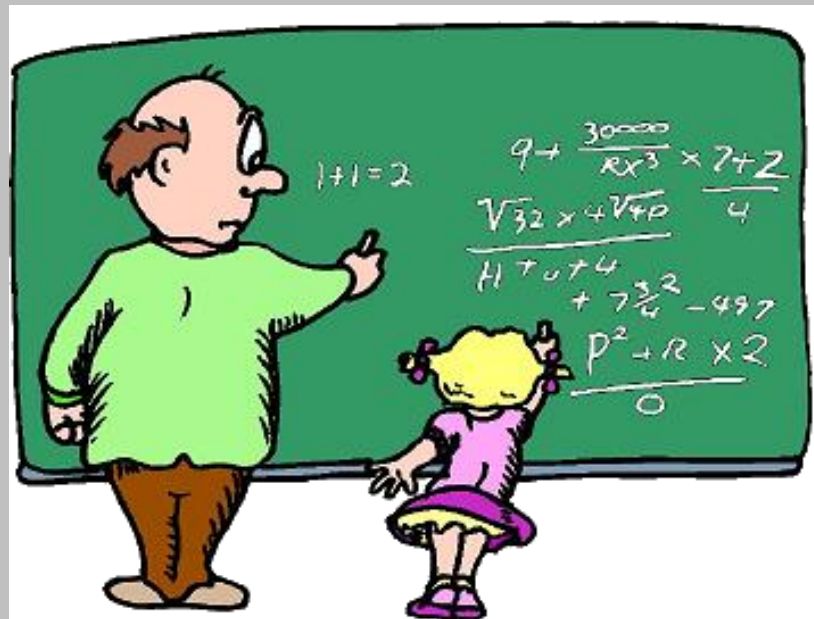# Topic:
Factoring Polynomials

Overview:

This lesson is on factoring quadratic expression when a = 1. This lesson should be done after students have already learned about GCF and the Difference of Two Perfect Squares. This lesson would work better in a lab class with a small group of students.

Objective:

Students will be able to factor a quadratic expression of the form $ax^2 + bx + c$.
Only when a = 1.

NYS Standards:

MST 3 - Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

Key Ideas:
Operations
3A - Use addition, subtraction, multiplication, division, and exponents with real numbers and algebraic expressions.
3D - Use field properties to justify mathematical procedures.
Patterns & Functions
7A - Represent and analyze functions, using verbal descriptions, tables, equations and graphs.

Duration:
Two 45 minute class periods

Materials/Web Resources:
1) Computer
2) SmartBoard
3) LCD Projector
4) Rags to Riches Game

Step by Step Procedure:

Day 1 -
1) Have students complete the DO NOW which consists of practicing the FOIL method. This will help them to understand that factoring is foiling backwards.
2) Go over the DO NOW with the students. Reveal answers by removing rectangles.
3) Have students copy down notes on factoring polynomials.
4) Go over a few examples with the students. Use the box on the side to drag over needed numbers and operators. Follow the steps that are listed on the notes page.
5) Then have students try them in their notebooks. Have a few volunteers come up and complete the problems on the smart board.
6) Hand out homework worksheet. Have students begin problems in class and finish for homework.

Day 2 -
1) Go over homework with students. Have a few volunteers complete the problems on the board or smartboard.
2) Then play "Rags to Riches" game which can be found at quia.com.
3) Have students complete each problem on a separate sheet of paper that will be handed in. As a class, vote for the answer.
4) Continue until game has ended.

<u>Do - Now</u>

1. (x - 4)(x + 5)   2

3. (x - 2)(x - 7)   4

Factoring Polynomials

Factor - Means to write the quadratic equation as the product of two linear expressions.

Quadratic Trinomial in the form:
$$ax^2 + bx + c$$

Steps for factoring:

1st - Find GCF (greatest common factor)
2nd - Multiply the values in a & c (ac)
3rd - List the factors of ac.
4th - Find the factors that when combined give you 'b'.

Examples: when a = 1

$x^2 + 7x + 10$

ac = __

$x^2 + 3x - 54$

ac = __

( ) ( ) ( )
( ) ( ) 5
3
4 + ‒ 9
7 + + 2 7
2 ‒ ‒
8 + 1
‒ + 6
1 + ‒
‒ 3
5 4 6

Examples: when a = 1

1. $x^2 + 7x - 18$ $\underline{ac = \_\_}$

2. $x^2 - 2x - 8$ $\underline{ac = \_\_}$

3. $x^2 + 11x - 26$ $\underline{ac = \_\_}$

4. $x^2 + 13x + 36$ $\underline{ac = \_\_}$

( ) ( ) ( )
( ) ( ) 5
$\overline{3}$
$4 + \overline{\ } \ 9$
$7 + \ ^{+}27$
$2 \overline{8} + \overline{1}$
$\overline{\ } \ + 6$
$1 + \overline{3}$
$\overline{5} \ 4 \ 6$

Homework:
Complete Factoring Worksheet

Rags to Riches

Start

Assessment:

Collect students work from "Rags to Riches Game" to check on their progress and understanding of the problems.

Students will also be tested on this material on the unit test.

Factoring (when a = 1).doc

Factoring Extra Practice

Rags to Riches Game