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Standards Correlations

The standards correlations below support the implementation of the Common Core Standards. This book includes station activity sets for the Common Core domains of Number and Quantity, Algebra, Functions, Geometry, and Statistics and Probability. This table provides a listing of the available station activities organized by Common Core standard.

The left column lists the standard codes. The first letter of the code represents the Common Core domain. The domain letter is followed by a dash and the initials of the cluster name, which is then followed by the standard number. The middle column lists the title of the station activity set that corresponds to the standard, and the right column lists the page number where the station activity set can be found.

The table indicates the standards that are heavily addressed in the station sets. If there are other standards that are addressed within the set, they can be found on the first page of each set.

Standards	Set title	Page number
N-CN.1	Operations with Complex Numbers	1
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Standards Correlations

Standards	Set title	Page number
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Algebra

Set 1: Factoring

Instruction

Goal: To provide opportunities for students to practice factoring quadratic equations

Common Core Standards

Algebra: Seeing Structure in Expressions

Write expressions in equivalent forms to solve problems.

A-SSE.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★

a. Factor a quadratic expression to reveal the zeros of the function it defines.

Student Activities Overview and Answer Key

Station 1

Given equations in the form $y = x^2 + bx + c$, $y = x^2 - bx + c$, $y = x^2 - bx - c$, or $y = x^2 + bx - c$, where b and c are integers, students work in groups to factor by grouping. Students will use algebra tiles as needed.

Answers

1. $(x + 4)(x + 4)$
2. $(x - 7)(x + 5)$
3. $(x - 1)(x + 9)$
4. $(x - 4)(x + 7)$
5. $(x + 2)(x - 1)$
6. $(x + 3)(x + 6)$
7. $(x - 4)(x + 11)$
8. $(x - 10)(x - 3)$
9. $(x - 5)(x + 5)$

Instruction

Station 2

Given equations in the form $y = x^2 + bx + c$, $y = x^2 - bx + c$, $y = x^2 - bx - c$, or $y = x^2 + bx - c$, where b and c are real numbers, students work in pairs to factor by grouping.

Answers

1. $\left(x - \frac{1}{2}\right)\left(x - \frac{3}{8}\right)$
2. $\left(x + \frac{1}{5}\right)(x - 5)$
3. $(x - 8)(x + 3)$
4. $\left(x + \frac{1}{3}\right)\left(x + \frac{2}{7}\right)$
5. $\left(x - \frac{1}{6}\right)(x - 2)$
6. $\left(x + \frac{4}{3}\right)(x - 14)$
7. $(x + 0.5)(x + 0.3)$
8. $(x + 0.2)(x - 0.12)$

Station 3

Given equations in the form $y = ax^2 + bx + c$, $y = ax^2 - bx + c$, $y = ax^2 - bx - c$, or $y = ax^2 + bx - c$, where a, b, and c are real numbers, students work in groups to factor by grouping. Students will use algebra tiles as needed.

Answers

1. $4(x + 2)(x - 2)$
2. $3(x - 1)(x - 7)$
3. $5(2x + 3)(x - 6)$
4. $\frac{1}{2}(3x - 1)(x - 2)$
5. $\frac{2}{5}(x + 4)(x - 10)$

6. $7(x+3)(3x+1)$
7. $\frac{1}{9}(x-5)(x-2)$
8. $\frac{3}{4}(4x-7)(x+2)$

Station 4

Students are given a set of 12 index cards, each inscribed with one of the following expressions: 8, 6, 1/2 , 10, 3, $(x-5)$, $(x+2)$, $(x-3)$, $(x+7)$, $(x+1)$, $(3x+2)$, and $\left(x-\frac{1}{2}\right)$. They use grouping to factor a series of equations. Each card appears as a factor at least once in this series of equations. Then students combine their cards in pairs to come up with quadratic equations of their own.

Answers

1. $(x-5)(x+1)$
2. $8\left(x-\frac{1}{2}\right)(3x+2)$
3. $6(x-3)(3x+2)$
4. $\frac{1}{2}(x+7)(x+2)$
5. $10(x+1)\left(x-\frac{1}{2}\right)$
6. $3(x-5)(x-3)$
7. Answers will vary. Students should create three quadratic expressions that combine the factors on the cards.

Materials List/Setup

Station 1 algebra tiles

Station 2 none

Station 3 algebra tiles

Station 4 algebra tiles; 12 index cards with the following written on them (one expression per card): 8; 6; 1/2; 10; 3; $(x-5)$; $(x+2)$; $(x-3)$; $(x+7)$; $(x+1)$; $(3x+2)$; $\left(x-\frac{1}{2}\right)$

Instruction

Discussion Guide

To support students in reflecting on the activities and to gather some formative information about student learning, use the following prompts to facilitate a class discussion to "debrief" the station activities.

Prompts/Questions

1. What are factors?
2. What is distribution? How does it apply to binomial factors?
3. How do you factor a quadratic equation?
4. If you factor a quadratic equation that is set equal to 0, what points on the equation's graph do the factors represent? Why?

Think, Pair, Share

Have students jot down their own responses to questions, then discuss with a partner (who was not in their station group), and then discuss as a whole class.

Suggested Appropriate Responses

1. Factors are the quantities that are multiplied to produce a product.
2. Distribution is a property of real numbers that allows the multiplication of a term to a sum of terms. With a pair of binomials that are being multiplied together, the distributive property is used twice. Take the first term in the first binomial and multiply it by each term in the second binomial, adding the products. Then take the second term in the first binomial and multiply it by each term in the second binomial, adding all the products together.
3. Rewrite the equation in $y = ax^2 + bx + c$ form, with all x expressions and constants on the same side of the equation. Find the factors of a and the factors of c that combine to create b.
4. They represent the x-intercepts, because those are the points at which $y = 0$.

Possible Misunderstandings/Mistakes

- Incorrectly factoring quadratic expressions
- Incorrectly factoring constants and coefficients
- Not understanding factoring
- Not understanding polynomial factoring
- Not simplifying the equation before factoring
- Making simple arithmetical errors in factoring

NAME:

Algebra

Set 1: Factoring

Station 1

Work as a group to factor each equation. Use the algebra tiles if you wish. Show all your work.

1. $y = x^2 + 8x + 16$

2. $y = x^2 - 2x - 35$

3. $y = x^2 + 8x - 9$

4. $y = x^2 + 3x - 28$

5. $y = x^2 + x - 2$

6. $y = x^2 + 9x + 18$

7. $y = x^2 + 7x - 44$

8. $y = x^2 - 13x + 30$

9. $y = x^2 - 25$

Algebra

Set 1: Factoring

Station 2

Work in pairs to factor each equation. Show all your work. Check your work by using distribution to find the product of your factors.

1. $y = x^2 - \frac{7}{8}x + \frac{3}{16}$

2. $y = x^2 - \frac{24}{5}x - 1$

3. $y = x^2 - 5x - 24$

4. $y = x^2 + \frac{13}{21}x + \frac{2}{21}$

5. $y = x^2 - \frac{13}{6}x + \frac{1}{3}$

6. $y = x^2 - \frac{38}{3}x - \frac{56}{3}$

7. $y = x^2 + 0.8x + 0.15$

8. $y = x^2 + 0.08x - 0.024$

Algebra

Set 1: Factoring

Station 3

Work as a group to factor each equation. Use the algebra tiles if you wish. Show all your work.

1. $y = 4x^2 - 16$

2. $y = 3x^2 - 24x + 21$

3. $y = 10x^2 - 45x - 90$

4. $y = \frac{3}{2}x^2 - \frac{7}{2}x + 1$

5. $y = \frac{2}{5}x^2 - \frac{12}{5}x - \frac{80}{5}$

6. $y = 21x^2 + 70x + 21$

7. $y = \frac{x^2}{9} - \frac{5}{9}x - \frac{2}{9}x + \frac{10}{9}$

8. $y = 3x^2 + \frac{3}{4}x - \frac{21}{2}$

Algebra

Set 1: Factoring

Station 4

At this station, you will find algebra tiles and 12 index cards marked with the following expressions:

$$8;\ 6;\ \frac{1}{2};\ 10;\ 3;\ (x-5);\ (x+2);\ (x-3);\ (x+7);\ (x+1);\ (3x+2);\ \left(x-\frac{1}{2}\right)$$

Work as a group to factor each equation below, using the index cards provided. You will also use the factors later in the activity. Use the algebra tiles if you wish. Show all your work.

1. $y = x^2 - 4x - 5$

2. $y = 24x^2 + 4x - 8$

3. $y = 18x^2 - 42x - 36$

4. $y = \frac{1}{2}x^2 + \frac{9}{2}x + 7$

5. $y = 10x^2 + 5x - 5$

6. $y = 3x^2 - 24x + 45$

7. Combine your factor cards to form three different quadratic equations. Write your equations below.