Unit 8, Lesson 9

Equivalent Equations and Functions

Let's explore equivalent equations.

9.1 More Equivalent Equations

Explain why each of these equations is equivalent to $5(2x - 20) + 4 = 8$.

1. $10x - 100 = 4$

2. $10(x - 10) + 4 = 8$

3. $10x = 104$

4. $x = \frac{52}{5}$

9.2 Finding Solutions and Functions

Here is a list of possible solutions to equations.

- -9
- -7
- -6
- -4
- 0
- 3
- 4
- 5
- 6
- 7

1. For each equation, find any values on the list that are solutions. (Some equations have two solutions, and some have only one.)

   a. $35 = x^2 - 1$

   b. $(x - 5)(x + 7) = 0$

   c. $0 = (7 - x) \cdot x$

   d. $(x + 3)^2 = 36$

   e. $x^2 + 8x + 16 = 0$

2. For each function, explain how it is related to the associated equation from the first question. Then, graph the function using technology. Where can you see the solution to each equation on its graph?

   a. $f(x) = x^2 - 36$

   b. $g(x) = (x - 5)(x + 7)$

   c. $h(x) = (7 - x) \cdot x$

   d. $k(x) = (x + 3)^2 - 36$

   e. $m(x) = x^2 + 8x + 16$

9.3 Card Sort: Matching Equations

Your teacher will give you a set of cards. Take turns with your partner to match two equivalent expressions.

1. For each match that you find, explain to your partner how you know it's a match.
2. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.