Lesson 1.3.2: Solution Sets for Equations and Inequalities

Targets:

1. I can explain that an equation or inequality with variables represents a question asking for the set of values one can assign to the variables to make the equation true.
2. I can identify when the solution set of an equation is "all real numbers."
3. I can represent the solution sets of equation and inequalities with a number line.

Warm Up

Think through part a of the warm up. Then read through part b and watch the video.

Consider the equation, $x^2 = 3x + 4$, where x represents a real number.

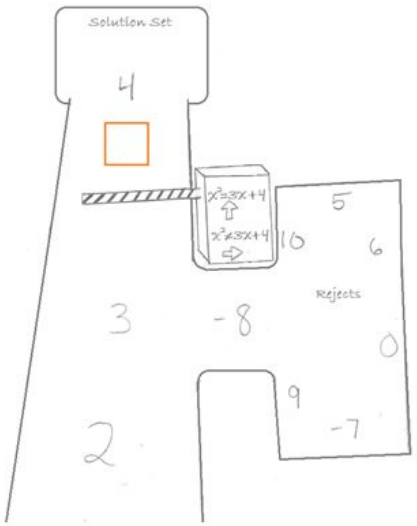
a. Are the expressions x^2 and $3x + 4$ algebraically equivalent?

b. The following table shows how we might "sift" through various values to assign to the variable symbol x in the hunt for values that would make the equation true.

x-VALUE	THE EQUATION	TRUTH VALUE
Let $x = 0$	$0^2 = 3(0) + 4$	FALSE
Let $x = 5$	$5^2 = 3(5) + 4$	FALSE
Let $x = 6$	$6^2 = 3(6) + 4$	FALSE
Let $x = -7$	$(-7)^2 = 3(-7) + 4$	FALSE
Let $x = 4$	$4^2 = 3(4) + 4$	TRUE
Let $x = 9$	$9^2 = 3(9) + 4$	FALSE
Let $x = 10$	$10^2 = 3(10) + 4$	FALSE
Let $x = -8$	$(-8)^2 = 3(-8) + 4$	FALSE

Visual Aid

Watch the video and use the image to follow along.



Practice 1

Find the solution set of the equation **$7 + p = 12$**

Then watch the video and take notes on the vocab that follows.

<u>Solution Set</u>:

<u>Solve an Equation</u>:

Practice 2

Now find the solution set to this equation: **6x + 3 = 3(2x + 1)**

Identity/All Real Numbers

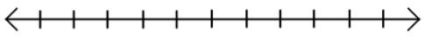
In the last video it introduces something called an "Identity."

- What is an identity?
- Give an example of an identity.
- Why does an identity result in all real numbers as the solution?

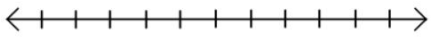
Solutions on a Number Line

How do we represent a solution set using a number line? Look at the last three examples we've done (the warm up, practice 1, and practice 2) and try to represent their solution sets using a number line. If you get stuck, the next video walks through the steps.

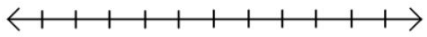
Warm Up Solutions



Practice 1 Solutions

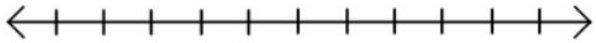


Practice 2 Solutions



Inequalities

Now see if you remember how to find the solution set of an inequality. Find the solution set and represent it on a number line of this inequality: ***w* + 2 > 4**



Exit Ticket

Indicate whether each of the following equations is sure to have a solution set of "all real numbers." EXPLAIN YOUR ANSWER FOR EACH.

a. $3(x+1) = 3x+1$

b. $x + 2 = 2 + x$

c. $4x(x+1) = 4x + 4x^2$

d. $3x(4x)(2x) = 72x^3$