

**Unit 1 Day 13:  $\emptyset$  Solution and  $\infty$  Solution**

Focus Question: How do I tell when an equation has no solution or infinite solutions?

A. Infinite Solutions

Use the equation  $3 - 2x = 3x + 5 - 2 - 5x$

1. Is  $x = 6$  a solution? <sup>substitute</sup>

$$3 - 2(6) = 3(6) + 5 - 2 - 5(6)$$

$$-9 = -9$$

True

so yes  $x=6$  is a sol'n

2. Is  $x = 0$  a solution?

$$3 - 2(0) = 3(0) + 5 - 2 - 5(0)$$

$$3 = 3$$

True

so yes  $x=0$  is a sol'n

3. Is  $x = -2$  a solution?

4. Can you find another solution?

5. Solve the equation to help you fill in the blanks:

An equation will have infinite  
 (symbol:  $\infty$ ) solutions when the  
 two expressions  
 have same coefficients AND  
same constants.

\*  $3 - 2x = 3x + 5 - 2 - 5x$

$$3 - 2x = -2x + 3$$

$\downarrow$   $+2x$        $\downarrow$   $+2x$

$$3 = 3$$

our  $x$  is gone!  
 $3 = 3$  is true

const.      coeff.      coeff.

$$3 - 2x = -2x + 3$$

exp      exp

6. Do the following equations have  $\infty$  solutions? Explain.

a.  $3x + 6 = 3x + 6$  does have  $\infty$  solutions because same coefficient & same constant.

b.  $\frac{1}{4}x - 2 = \frac{1}{4}x + 6$  doesn't have  $\infty$  solutions because they don't have the same constant.

c.  $2x - 4 = 7x + 2$  doesn't have  $\infty$  solutions because nothing is the same.

d.  $\frac{1}{3}x - 4 = -4 + \frac{1}{3}x$  does have  $\infty$  solutions because same coeff & same constant.



