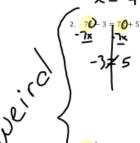
Lesson 7 8•4

Lesson 7: Classification of Solutions

Classwork

Exercises

Solution 7(4)-3 = 5(4)+5 25 = 25



same coefficient different constants

that can ever be plugged. In for the veriable that will make this equation

* Every number in existence will make this equation true, because the variable will always cancel out and leave equal constants.

Classification of Solutions

engage^{ny}

one
$$5x + 3 = 4x - 1$$

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

$$-5 + 7x = 7x - 5$$

Many

One solution

$$30 + 1 = 16$$
 $-1x - \frac{1}{2}$
 $2x + 1 = 11$
30 or 30

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Give a brief explanation as to what kind of solution(s) you expect the following linear equations to have. Transform the equation into a simpler form if necessary.

4.
$$11x - 2x + 15 = 8 + 7 + 9x$$

5.
$$3(x-14)+1=-4x+5$$

6.
$$-3x + 32 - 7x = -2(5x + 10)$$

7.
$$\frac{1}{2}(8x + 26) = 13 + 4x$$



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8. Write two equations that have no solutions.

Write two equations that have one unique solution each.
$$11 \times -2 = 7 \times +4$$

$$3x-5 = 4x-3$$

10. Write two equations that have infinitely many solutions.

$$4x - 2 = -2 + 4x$$

 $450x - 5 = -5 + 450x$

Many solutions

No Soluti	ion		

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Lesson Summary

There are three classifications of solutions to linear equations: one solution (unique solution), no solution, or infinitely many solutions.

Equations with no solution will, after being simplified, have coefficients of x that are the same on both sides of the equal sign and constants that are different. For example, x + b = x + c, where b and c are constants that are not equal. A numeric example is 8x + 5 = 8x - 3.

Equations with infinitely many solutions will, after being simplified, have coefficients of x and constants that are the same on both sides of the equal sign. For example, x + a = x + a, where a is a constant. A numeric example is 6x + 1 = 1 + 6x.

Problem Set

- 1. Give a brief explanation as to what kind of solution(s) you expect for the linear equation $18x + \frac{1}{2} = 6(3x + 25)$. Transform the equation into a simpler form if necessary.
- 2. Give a brief explanation as to what kind of solution(s) you expect for the linear equation 8 9x = 15x + 7 + 3x. Transform the equation into a simpler form if necessary.
- Give a brief explanation as to what kind of solution(s) you expect for the linear equation 5(x + 9) = 5x + 45. Transform the equation into a simpler form if necessary.
- 4. Give three examples of equations where the solution will be unique, that is, only one solution is possible.
- 5. Solve one of the equations you wrote in Problem 4, and explain why it is the only solution.
- 6. Give three examples of equations where there will be no solution.
- 7. Attempt to solve one of the equations you wrote in Problem 6, and explain why it has no solution.
- 8. Give three examples of equations where there will be infinitely many solutions.
- 9. Attempt to solve one of the equations you wrote in Problem 8, and explain why it has infinitely many solutions.

Classification of Solutions

