Lesson 13: Some Potential Dangers When Solving Equations

Opening Exercise

Answer the following questions.

|  |  |
| --- | --- |
| a. Why should the equations and have the same solution set? | b. Why should the equations and have the same solution set? |
| c. Do you think the equations and should have the same solution set? Why? | d. Do you think the equations and should have the same solution set? Explain why. |

**Classwork**

Exercise 1

1. Describe the property used to convert the equation from one line to the next:

 4 = x \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Exercise 2**

Solve the equation for . For each step, describe the operation used to convert the equation.

Exercise 3

Consider the equations and .

1. Verify that is a solution to both equations.
2. Find a second solution to the second equation.
3. Based on your results, what effect does squaring both sides of an equation appear to have on the solution set?

Exercise 4

Consider the equations and . What is the value of x?

a. Did squaring both sides of the equation

affect the solution sets?

Exercise 5

Consider the equation .

|  |  |
| --- | --- |
| Multiply both sides of the equation by a constant **(pick a number any number)** and show that the solution set did not change. | Now, multiply both sides by . Show that is still a solution to the new equation. Is there another solution? |
| Based on your results, what effect does multiplying both sides of an equation by a constant have on the solution set of the new equation? | Based on your results, what effect does multiplying both sides of an equation by a variable factor have on the solution to an equation? |

Lesson Summary

Assuming that there is a solution to an equation, applying the distribution, commutative and associative properties and the properties of equality to equations will not change the solution set.

Feel free to try doing other operations to both sides of an equation, but be aware – the new solution set you get contains possible CANDIDATES for solutions. You have to plug each one into the original equation to see if they really are solutions to your original equation.

Problem Set

1. Solve each equation for . For each step, describe the operation used to convert the equation.

* 1.

2. Solve the equation for x: . Multiply both sides of the original equation by

 and find the solution set of the new equation.

3. Solve the equation for . Square both sides of the equation and verify that your

 solution satisfies this new equation.

4. Consider the equation . 5. Consider the equation .

What is the solution set? What is the solution set?