**Section 2.3: Proofs with Algebra Properties**

**Learning Target:**

**Homework:**

|  |  |  |
| --- | --- | --- |
| **Property** | **What is it?** | **Example** |
| Addition Property |  | If x – 10 = 4, then |
| Subtraction Property |  | If 2x + 6 = -8, then |
| Multiplication Property |  | If , then |
| Division Property |  | If 4x = -16, then |
| Reflexive Property |  | If 2x – 8 =14, then |
| Symmetric Property |  | If x – 6 = 2x + 8, then |
| Transitive Property |  | If x +6 = 4 and 4 = 3 + 1, then |
| Substitution Property |  | If 3x – 6 and x = 5, then  If 2(2x + 4x) + 5, then |

Summary:

***Example #1: Solve the equation and determine the reasons for each step.***

Given: 

Prove: 

|  |  |
| --- | --- |
| **Statement** | **Reason** |
| 1. 10 = 3*x* - 5 | 1. |
| 2. 3*x* – 5 = 10 | 2. |
| 3. 3x = 15 | 3. |
| 4. x = 5 | 4. |

***Example #2: Re-write the proof above in the form of a paragraph proof by filling in the blanks.***

Given that , because of the symmetric property. Using the property, 3x = 15. Therefore, because of the property.

***Example #3: Complete the proof below by using a 2-column proof and then re-write as a paragraph proof.***

Given: 4*x* – 6 = 2*x* + 18

Prove: *x* = 12