# Topic 4-3: Algebraic Proof

First, let's solve this equation algebraically. Then out to the side use our own words to give a step by step description of the process:

| Solve the equation | Describe the steps |
|---|---|
| $5(x+3)+9=19$ | |

**We are going to write proofs using a 2-column format.**

A **proof** is an argument that uses logic, definitions, properties, and previously proven statements to show that a conclusion is true.

The **"Given"** part in a proof is the "if" part of a conditional.

The **"Prove"** part in a proof is the "then" part of a conditional.

Write the above problem as a conditional statement.

If _____, then x = _____.

**Properties Used in Algebraic Proofs:**

Watch Video and Hand Out Fact Sheet

Given: 4m – 8 = -12 Prove : m = -1

| Statements | Reasons |
|---|---|
| **1.** 4m – 8 = -12 | **1.** |
| **2.** 4m = -4 | **2.** |
| **3.** m = -1 | **3.** |

Given: a(b + 2) = 45; a = 3 Prove: b = 13

| **Statements** | **Reasons** |
|---|---|
| **1.** a(b + 2) = 45 | **1.** |
| **2.** | **2. Given** |
| **3.** 3(b + 2) = 45 | **3.** |
| **4.** | **4. Distributive Property** |
| **5.** 3b = 39 | **5.** |
| **6.** b = 13 | **6.** |