2-6 Algebraic Proofs	Name_____
Geometry	Period _____

A two-column proof or _____ _____ contains statements and reasons organized in two- columns.

One type of two-column proof is an _____ _____. An algebraic proof is made up of a series of algebra statements. We can use properties of real numbers in algebraic proofs.

Property	**Definition**
Addition Property of Equality	
Subtraction Property of Equality	
Multiplication Property of Equality	
Division Property of Equality	
Transitive Property of Equality	
Substitution Property of Equality	
Distributive Property	

Example 1:

Given: $8x - 5 = 2x + 1$
Prove: $x = 1$
Proof:

Statements	**Reasons**
a. $8x - 5 = 2x + 1$	**a.** _____
b. $8x - 5 - 2x = 2x + 1 - 2x$	**b.** _____
c. _____	**c.** Substitution Property
d. _____	**d.** Addition Property
e. $6x = 6$	**e.** _____
f. $\frac{6x}{6} = \frac{6}{6}$	**f.** _____
g. _____	**g.** _____

Example 2:

Given: $\frac{4x+6}{2} = 9$
Prove: $x = 3$
Proof:

Statements	Reasons
a. $\frac{4x+6}{2} = 9$	**a.** _____
b. $\left(\frac{4x+6}{2}\right) = 2(9)$	**b.** Mult. Prop.
c. $4x + 6 = 18$	**c.** _____
d. $4x + 6 - 6 = 18 - 6$	**d.** _____
e. $4x =$ _____	**e.** Substitution
f. $\frac{4x}{4} =$ _____	**f.** Div. Prop.
g. _____	**g.** Substitution

Example 3:

PROOF **Write a two-column proof to verify each conjecture.**

1. If $m\angle ABC + m\angle CBD = 90$, $m\angle ABC = 3x - 5$, and $m\angle CBD = \frac{x+1}{2}$, then $x = 27$.