

# **ALGEBRAIC PROOFS**

## Proof Puzzle #1

**Directions:** Using the blank proof sheet, arrange these statements and reasons to complete the proof and then glue them on the proof sheet. Be sure to provide the given and prove at the beginning of the proof! And don't forget to number properly!

**Problem:** If  $2x + 6 = 3 + \frac{5}{3}x$ , then  $x = -9$

**Statements and Reasons:**

$$x + 18 = 9$$

$$3(2x + 6) = 3(3 + \frac{5}{3}x)$$

$$2x + 6 = 3 + \frac{5}{3}x$$

$$x = -9$$

$$6x + 18 = 9 + 5x$$

Given

Subtraction Property (=)

Subtraction Property (=)

Multiplication Property (=)

Distributive Property (=)

## Proof Puzzle #2

**Directions:** Using the blank proof sheet, arrange these statements and reasons to complete the proof and then glue them on the proof sheet. Be sure to provide the given and prove at the beginning of the proof! And don't forget to number properly!

**Problem:** If  $AC = AB$ ,  $AC = 4x + 1$ , and  $AB = 6x - 13$ , then  $x = 7$

**Statements and Reasons:**

$$x = 7$$

$$14 = 2x$$

$$7 = x$$

$$AC = AB, AC = 4x + 1, \text{ and } AB = 6x - 13$$

$$1 = 2x - 13$$

$$4x + 1 = 6x - 13$$

Given

Subtraction Property (=)

Symmetric Property (=)

Substitution Property (=)

Division Property (=)

Addition Property (=)

## SCRAMBLED PROOF ACTIVITY 1

Scrambled Proof activities could be used:

- A. to introduce a lesson,
- B. to check each student's understanding before a test is given,
- C. for drill; or
- D. to use as a test item.

**DIRECTIONS:** After making a copy of the activity, the copy should be cut along the broken lines and placed in an envelope. The number in parenthesis, (10), is simply a reference number and is used if several activities happen to become mixed up.

The original copy is the correct answer.

(10) Solve $4(x + 3) = 36$ .	(10)
(10) $4(x + 3) = 36$	Given (10)
(10) $4x + 12 = 36$	Distributive Property (10)
(10) $-12 = -12$	Reflexive Property of Equality (10)
(10) $4x = 24$	Addition Property of Equality (10)
(10) $\frac{1}{4} = \frac{1}{4}$	Reflexive Property of Equality (10)
(10) $x = 6$	Multiplication Property of Equality (10)

## SCRAMBLED PROOF ACTIVITY 2

Have the students match the algebraic expressions with the name of the property the expression illustrates.

(11) If $QR + RS = QS$ , then $RS = QS - QR$	Subtraction Property of Equality (11)
(11) $AT + TR = AT + TR$	Reflexive Property of Equality (11)
(11) If $x = 6$ and $y = 4$ , then $x + y = 6 + 4$ .	Addition Property of Equality (11)
(11) If $12 > 9$ and $d > 0$ , then $12d > 9d$	Multiplication Property of Inequality (11)
(11) If $w = r$ and $r = q$ , then $w = q$ .	Transitive Property of Equality (11)
(11) $8(3x - 11) = 24x - 88$	Distributive Property (11)
(11) If $4x = 16$ , then $x = 4$	Multiplication Property of Equality (11)
(11) If $QR - WX = TR$ , then $QR = TR + WX$ .	Addition Property of Equality (11)
(11) If $AB + BC = AC$ and $AB = QR$ , then $QR + BC = AC$ .	Substitution Property of Equality (11)
(11) If $AR = AC + CR$ and $AC + CR = HL$ , then $AR = HL$ .	Transitive Property of Equality (11)

## PROOF SHEET

**Given:**

**Prove:**

**Proof:**

Statements	Reasons