

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Score: \_\_\_\_\_

# Algebraic Proofs

Complete each proof.

1. Given:  $4x + 8 = x + 2$

Prove:  $x = -2$

Proof:

Statements	Reasons
a. $4x + 8 = x + 2$	_____
b. $4x + 8 - x =$ _____	_____
c. _____	_____
d. $3x + 8 - 8 = 2 - 8$	_____
e. $3x =$ _____	_____
f. $\frac{3x}{3} = -\frac{6}{3}$	_____
g. _____	_____

2. Given:  $6(x - 6) = x(16 - 7)$

Prove:  $x = -12$

Proof:

Statements	Reasons
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____
g. _____	_____

3. Given:  $3(4x + 7) = 45$

Prove:  $x = 2$

Proof:

Statements	Reasons
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____
f. _____	_____

4. Given:  $x - 1 = \frac{x - 10}{2}$

Prove:  $x = -8$

Proof:

Statements	Reasons
a. _____	_____
b. _____	_____
c. _____	_____
d. _____	_____
e. _____	_____

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# Algebraic Proofs

## Answers

1. Given:  $4x + 8 = x + 2$

Prove:  $x = -2$

Proof:

Statements	Reasons
a. $4x + 8 = x + 2$	<u>Given</u>
b. $4x + 8 - x = x + 2 - x$	<u>Subtraction Prop.</u>
c. $3x + 8 = 2$	<u>Substitution Prop.</u>
d. $3x + 8 - 8 = 2 - 8$	<u>Subtraction Prop.</u>
e. $3x = -6$	<u>Substitution Prop.</u>
f. $\frac{3x}{3} = \frac{-6}{3}$	<u>Division Prop.</u>
g. $x = -2$	<u>Substitution Prop.</u>

2. Given:  $6(x - 6) = x(16 - 7)$

Prove:  $x = -12$

Proof:

Statements	Reasons
a. $6(x - 6) = x(16 - 7)$	<u>Given</u>
b. $6(x - 6) = x(9)$	<u>Substitution Prop.</u>
c. $6x - 36 = 9x$	<u>Distributive Prop.</u>
d. $6x - 36 - 6x = 9x - 6x$	<u>Subtraction Prop.</u>
e. $-36 = 3x$	<u>Substitution Prop.</u>
f. $-\frac{36}{3} = \frac{3x}{3}$	<u>Division Prop.</u>
g. $x = -12$	<u>Symmetric Prop.</u>

3. Given:  $3(4x + 7) = 45$

Prove:  $x = 2$

Proof:

Statements	Reasons
a. $3(4x + 7) = 45$	<u>Given</u>
b. $12x + 21 = 45$	<u>Distributive Prop.</u>
c. $12x + 21 - 21 = 45 - 21$	<u>Subtraction Prop.</u>
d. $12x = 24$	<u>Substitution Prop.</u>
e. $\frac{12x}{12} = \frac{24}{12}$	<u>Division Prop.</u>
f. $x = 2$	<u>Substitution Prop.</u>

4. Given:  $x - 1 = \frac{x - 10}{2}$

Prove:  $x = -8$

Proof:

Statements	Reasons
a. $x - 1 = \frac{x - 10}{2}$	<u>Given</u>
b. $2(x - 1) = x - 10$	<u>Multiplication Prop.</u>
c. $2x - 2 = x - 10$	<u>Distributive Prop.</u>
d. $x - 2 = -10$	<u>Subtraction Prop.</u>
e. $x = -8$	<u>Addition Prop.</u>