

2.5 Worksheet: Algebraic Proofs

Complete the proofs below.

1. **Given:** $3x + 12 = 8x - 18$

Prove: $x = 6$

Statements	Reasons

2. **Given:** $3k + 5 = 17$

Prove: $k = 4$

Statements	Reasons

3. **Given:** $-6a - 5 = -95$

Prove: $a = 15$

Statements	Reasons

7. **Given:** $\frac{1}{5}(a+10) = -3$

Prove: $a = \underline{\hspace{2cm}}$

Statements	Reasons

8. **Given:** $m\angle 1 = 45^\circ, m\angle 2 = m\angle 1$

Prove: $m\angle 2 = 45^\circ$

Statements	Reasons

9. **Given:** $\angle 1 \cong \angle 2, \angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 3$

Statements	Reasons

Write the letter of each property next to its definition. The letters a , b , and c represent real numbers. You may use a property more than once.

_____ 10. If $5 = x$, then $x = 5$

_____ 11. If $a = b$, then $2a = 2b$

_____ 12. $m = n$, so $n = m$

_____ 13. $7 = 7$

_____ 14. If $a = b$, then $a + 8 = b + 8$

_____ 15. $9(x + y) = 9x + 9y$

_____ 16. If $x = 3$ and $3 = y$, then $x = y$

_____ 17. $p = q$ and $q = -1$, so $p = -1$

_____ 18. If $3x = 27$, then $x = 9$

_____ 19. If $a = b$ and $c \neq 0$, then $\frac{a}{c} = \frac{b}{c}$

_____ 20. If $a = b$, then b can be replaced by a in an expression.

_____ 21. If $a = b$, then $a - c = b - c$

A. Addition Property of Equality

B. Subtraction Property of Equality

C. Multiplication Property of Equality

D. Division Property of Equality

E. Reflexive Property of Equality

F. Symmetric Property of Equality

G. Transitive Property of Equality

H. Substitution Property

I. Distributive Property