

Properties of Equality & Congruence

Name the property illustrated below.

1. If $UV = KL$ and $KL = 6$, then $UV = 6$.

Transitive

2. If $m\angle 1 + m\angle 2 = m\angle 4 + m\angle 2$, then $m\angle 1 = m\angle 4$

Subtraction

3. $\angle ABC \cong \angle ABC$

Reflexive

4. If $\frac{1}{2}m\angle D = 45$, then $m\angle D = 90$.

Multiplication

5. If $\angle DEF \cong \angle HJK$, then $\angle HJK \cong \angle DEF$

Symmetric

6. If $y = 12 - x$ and $2x + 3y = 10$, then $2x + 3(12 - x) = 10$.

Substitution

7. If $x = 5$, then $x + 3 = 8$

Addition

8. If $AB = MN$ and $MN = XY$, then $AB = XY$.

Transitive

9. If $2(AX) = 2(BY)$, then $AX = BY$

Division

10. If $m\angle 1 = 40$ and $m\angle 2 = m\angle 1 + 50$, then $m\angle 2 = 90$

Substitution

Use the given property to complete each statement.

11. Reflexive Property of Congruence

$$\angle TRS \cong \underline{\angle TRS}$$

12. Substitution Property

$$\text{If } AB = 2, \text{ and } AC = AB + BC, \text{ then } AC = \underline{2 + BC}$$

13. Subtraction Property of Equality

$$\text{If } 25x + 12 = 32, \text{ then } 25x = \underline{20}$$

14. Transitive Property of Equality

$$\text{If } RM = OP \text{ and } OP = XT, \text{ then } \underline{RM = XT}$$

15. Symmetric Property of Congruence

$$\text{If } \angle TES \cong \angle BKC, \text{ then } \underline{\angle BKC \cong \angle TES}$$

16. Division Property of Equality

$$\text{If } 4m\angle ABC = 120^\circ, \text{ then } m\angle ABC = \underline{30^\circ}$$

Fill in the reason that justifies each step.

Given: $AC = 36$



$$AB + BC = AC$$

17. Seg. Add Post

$$3x + 2x + 1 = 36$$

18. Subst.

$$5x + 1 = 36$$

19. Simplify

$$5x = 35$$

20. Subtr.

$$x = 7$$

21. Div.

Solve the equation and state the reason for each step.

$$5(2x - 1) = 9x + 4$$

$$10x - 5 = 9x + 4$$

Distr.

$$x - 5 = 4$$

Subtr.

$$x = 9$$

Add.