## Segment and Angle proofs

**Name the property that the statement illustrates.**

____ 1. $\overline{CD} \cong \overline{CD}$
   a. Reflexive Property of Segment Congruence
   b. Transitive Property of Segment Congruence
   c. Symmetric Property of Segment Congruence

____ 2. If $\angle B \cong \angle C$ and $\angle C \cong \angle D$, then $\angle B \cong \angle D$.
   a. Transitive Property of Angle Congruence
   b. Symmetric Property of Angle Congruence
   c. Reflexive Property of Angle Congruence

____ 3. If $\overline{MN} \cong \overline{XY}$ and $\overline{XY} \cong \overline{RS}$, then $\overline{MN} \cong \overline{RS}$
   a. Transitive Property of Segment Congruence
   b. Symmetric Property of Segment Congruence
   c. Reflexive Property of Segment Congruence

**Identify the numbered statement or reason in the two-column proof.**

**Given**    $\angle ABC$ is a right angle.
**Prove**    $x = 8$
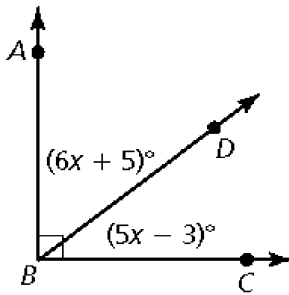


| STATEMENTS | REASONS |
|---|---|
| **1.** $\angle ABC$ is a right angle. | **1.** Given |
| **2.** $m\angle ABC = 90°$ | **2.** |
| **3.** | **3.** Angle Addition Postulate |
| **4.** $(6x + 5)° + (5x - 3)° = 90°$ | **4.** Substitution Property of Equality |
| **5.** $11x + 2 = 90$ | **5.** Simplify. |
| **6.** | **6.** Subtraction Property of Equality |
| **7.** $x = 8$ | **7.** |

____ 4. What is Statement 3?
   a. $\overrightarrow{BA} \perp \overrightarrow{BC}$        c. $m\angle ABD = m\angle CBD$
   b. $2(m\angle ABD) = 90°$      d. $m\angle ABD + m\angle CBD = 90°$

_____ 5. What is Reason 7?
    a.   Simplify.
    b.   Symmetric Property of Equality
    c.   Addition Property of Equality
    d.   Division Property of Equality

**Identify the numbered statement or reason in the two-column proof.**

**Given** $m\angle ABF = 90°$, $m\angle CBF = 90°$, $m\angle DBF = m\angle EBF$
**Prove** $m\angle ABD = m\angle CBE$
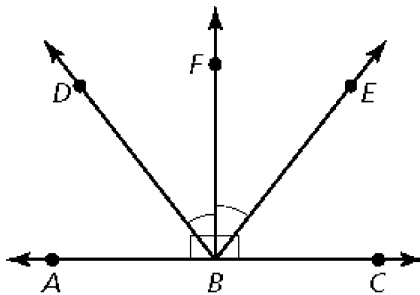


| STATEMENTS | REASONS |
|---|---|
| **1.** $m\angle ABF = 90°$, $m\angle CBF = 90°$, $m\angle DBF = m\angle EBF$ | **1.** Given |
| **2.** $m\angle ABF = m\angle CBF$ | **2.** |
| **3.** $m\angle ABF = m\angle ABD + m\angle DBF$ $m\angle CBF = m\angle CBE + m\angle EBF$ | **3.** |
| **4.** | **4.** Transitive Property of Equality |
| **5.** $m\angle ABD + m\angle EBF = m\angle CBE + m\angle EBF$ | **5.** |
| **6.** $m\angle ABD = m\angle CBE$ | **6.** Subtraction Property of Equality |

_____ 6. What is Reason 3?
    a.   Definition of complementary angles
    b.   Substitution Property of Equality
    c.   Angle Addition Postulate
    d.   Linear Pair Postulate

_____ 7. What is Reason 5?
    a.   Angle Addition Postulate
    b.   Multiplication Property of Equality
    c.   Substitution Property of Equality
    d.   Addition Property of Equality

**Identify the numbered statement or reason in the two-column proof.**

**Given**     $EH = 28$, $EF = 2x - 1$, $FG = x + 5$, $GH = x$
**Prove**     $x = 6$
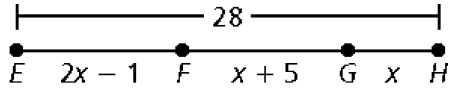


| STATEMENTS | REASONS |
|---|---|
| **1.** $EH = 28$, $EF = 2x - 1$, $FG = x + 5$, $GH = x$ | **1.** Given |
| **2.** $EH = EG + GH$<br>$EG = EF + FG$ | **2.** |
| **3.** $EH = EF + FG + GH$ | **3.** |
| **4.** $28 = (2x - 1) + (x + 5) + x$ | **4.** Substitution Property of Equality |
| **5.** | **5.** Simplify. |
| **6.** | **6.** Subtraction Property of Equality |
| **7.** $6 = x$ | **7.** Division Property of Equality |
| **8.** $x = 6$ | **8.** Symmetric Property of Equality |

____    8.   What is Reason 3?
       a.    Simplify.                      c.    Transitive Property of Equality
       b.    Substitution Property of Equality      d.    Addition Property of Equality

____    9.   What is Statement 6?
       a.    $18 = 4x$                             c.    $24 = 3x$
       b.    $12 = 2x$                            d.    $24 = 4x$

**Segment and Angle proofs**
**Answer Section**

1. A
2. A
3. A
4. D
5. D
6. C
7. C
8. B
9. D