 Name: _____

2.3.D1 – Forms of Proof

Past due on: _____ Period:_____

Identify the property demonstrated in each example.

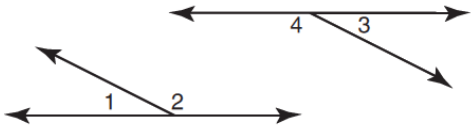
1. $m\angle ABC = m\angle XYZ$
   $m\angle ABC - m\angle RST = m\angle XYZ - m\angle RST$
2. $m\overline{QT} = m\overline{TU}$
   $m\overline{QT} + m\overline{WX} = m\overline{TU} + m\overline{WX}$
3. $\angle JKL \cong \angle JKL$
4. $GH = MN$ and $MN = OP$,
   so $GH = OP$
5. $m\overline{XY} = 4$ cm and $m\overline{BC} = 4$ cm,
   so $m\overline{XY} = m\overline{BC}$
6. $\overline{PR} \cong \overline{PR}$
7. $GH = JK$
   $GH - RS = JK - RS$
8. $m\angle 1 = 134°$ and $m\angle 2 = 134°$,
   so $m\angle 1 = m\angle 2$

<u>ON A SEPARATE SHEET OF PAPER</u>: Write each given proof as the indicated proof.

9. Write the two-column proof of the Congruent Supplement Theorem as a paragraph proof.

Given: $\angle 1$ is supplementary to $\angle 2$,
$\angle 3$ is supplementary to $\angle 4$,
and $\angle 2 \cong \angle 4$

Prove: $\angle 1 \cong \angle 3$

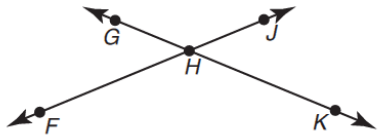


Statements	Reasons
1. $\angle 1$ is supplementary to $\angle 2$	1. Given
2. $\angle 3$ is supplementary to $\angle 4$	2. Given
3. $\angle 2 \cong \angle 4$	3. Given
4. $m\angle 2 = m\angle 4$	4. Definition of congruent angles
5. $m\angle 1 + m\angle 2 = 180°$	5. Definition of supplementary angles
6. $m\angle 3 + m\angle 4 = 180°$	6. Definition of supplementary angles
7. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	7. Substitution Property
8. $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	8. Substitution Property
9. $m\angle 1 = m\angle 3$	9. Subtraction Property of Equality
10. $\angle 1 \cong \angle 3$	10. Definition of congruent angles

10. Write the paragraph proof as a two-column proof.

Given: $\overline{GH} \cong \overline{HJ}$ and $\overline{FH} \cong \overline{HK}$

Prove: $\overline{GK} \cong \overline{FJ}$

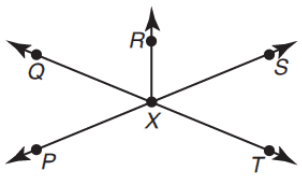


By the Segment Addition Postulate, $GK = GH + HK$. You are given that $\overline{GH} = \overline{HJ}$, so $GH = HJ$ by the definition of congruent segments, and you can use substitution to write $GK = HJ + HK$. You are also given that $\overline{FH} \cong \overline{HK}$, so $FH = HK$ by the definition of congruent segments, and you can use substitution to write $GK = HJ + FH$. By the Segment Addition Postulate, $FJ = FH + HJ$. So, you can use substitution to write $GK = FJ$. By the definition of congruent segments, $\overline{GK} \cong \overline{FJ}$.

11. Write the paragraph proof as a flow-chart proof.

Given: $m\angle QXR = m\angle SXR$

Prove: $m\angle PXR = m\angle TXR$



By the Angle Addition Postulate, $m\angle TXR = m\angle TXS + m\angle SXR$. It is given that $m\angle QXR = m\angle SXR$, so by substitution, $m\angle TXR = m\angle TXS + m\angle QXR$. Angles PXQ and TXS are vertical angles by the definition of vertical angles. Vertical angles are congruent by the Vertical Angle Theorem, so $\angle PXQ \cong \angle TXS$, and by the definition of congruent angles, $m\angle PXQ = m\angle TXS$. Using substitution, you can write $m\angle TXR = m\angle PXQ + m\angle QXR$. By the Angle Addition Postulate, $m\angle PXR = m\angle PXQ + m\angle QXR$. So, you can use substitution to write $m\angle PXR = m\angle TXR$.

12. Write the flow chart proof as a two-column proof.

Given: $\angle PQT \cong \angle RQS$

Prove: $\angle PQS \cong \angle RQT$