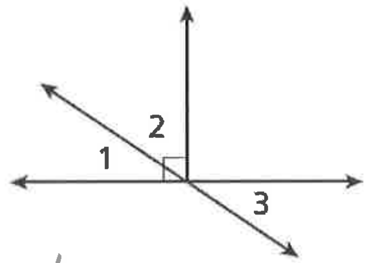
Name:______________________ Date:______________ Hour:______

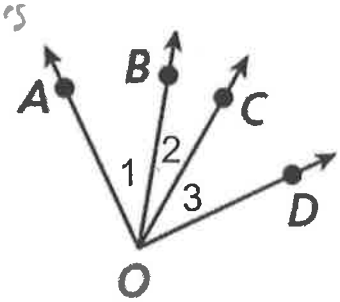
WS Geometric Proof 3

1. **Given:** $\angle 1$ and $\angle 2$ are complementary.
   Prove: $\angle 2$ and $\angle 3$ are complementary.



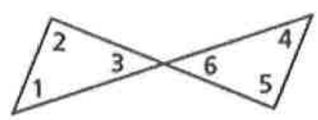
S	R
$\angle 1$ and $\angle 2$ are comp. $\angle$'s	Given
$m\angle 1 + m\angle 2 = 90$	Def. of complementary $\angle$'s
$\angle 1$ and $\angle 3$ are vertical $\angle$'s	Def. of vertical $\angle$'s
$\angle 1 \cong \angle 3$	Vertical $\angle$'s $\cong$ Thm
$m\angle 1 = m\angle 3$	Def. of $\cong$
$m\angle 3 + m\angle 2 = 90$	Sub
$\angle 2$ and $\angle 3$ comp. $\angle$'s	Def. of comp. $\angle$'s

2. Given: $\angle AOC \cong \angle BOD$
   Prove: ~~$\angle AOB \cong \angle COD$~~ → $m\angle 1 = m\angle 3$



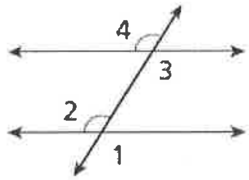
S	R
$\angle AOC \cong \angle BOD$	Given
$m\angle AOC = m\angle BOD$	Def. of $\cong$
$m\angle 1 + m\angle 2 = m\angle AOC$	$\angle$ Add. Postulate
$m\angle 2 + m\angle 3 = m\angle BOD$	$\angle$ Add. Postulate
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3$	Transitive POE
$-m\angle 2 \quad -m\angle 2$	Subtraction POE
$m\angle 1 = m\angle 3$	Simplify

3. **Given:** $\angle 2$ and $\angle 5$ are right angles.
   $m\angle 1 + m\angle 2 + m\angle 3 = m\angle 4 + m\angle 5 + m\angle 6$
   Prove: $\angle 1 \cong \angle 4$



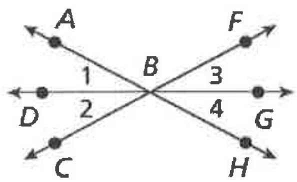
S	R
$\angle 2$ + $\angle 5$ are right $\angle$'s	Given
$m\angle 1 + m\angle 2 + m\angle 3 = m\angle 4 + m\angle 5 + m\angle 6$	Given
$m\angle 2 = 90$, $m\angle 5 = 90°$	Def. of right $\angle$'s
$\angle 3$ and $\angle 6$ are vertical $\angle$'s	Def. of vertical $\angle$'s
$\angle 3 \cong \angle 6$	Vertical $\angle$'s $\cong$ Thm
$m\angle 3 = m\angle 6$	Def. of $\cong$
$m\angle 1 + 90 + m\angle 3 = m\angle 4 + 90 + m\angle 3$	Substitution
$-90 \quad -m\angle 3 \quad -90 \quad -m\angle 3$	Subtraction POE
$m\angle 1 = m\angle 4$	Simplify
$\angle 1 \cong \angle 4$	Def. of $\cong$

4. **Given:** $\angle 2 \cong \angle 4$
Prove: $\angle 1 \cong \angle 3$



S	R
$\angle 2 \cong \angle 4$	Given
$\angle 1$ + $\angle 2$ vert. $\angle 3$ $\angle 3$ + $\angle 4$ vert. $\angle s$	> Def. of vert. $\angle$'s
$\angle 1 \cong \angle 2$, $\angle 3 \cong \angle 4$	Vert. $\angle$' $\cong$ Thm
$\angle 1 \cong \angle 4$	Transitive POC
$\angle 1 \cong \angle 3$	Transitive POC

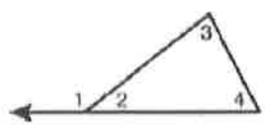
5. **Given:** $\overrightarrow{BD}$ bisects $\angle ABC$.
Prove: $\overrightarrow{BG}$ bisects $\angle FBH$.



S	R
$\overrightarrow{BD}$ bisects $\angle ABC$	Given
$\angle 1 \cong \angle 2$	Def. of Bisect
$\angle 1, \angle 4$ vert. $\angle$'s $\angle 2, \angle 3$ vert. $\angle$'s	> Def. of vert. $\angle$'s
$\angle 2 \cong \angle 3$, $\angle 1 \cong \angle 4$	Vert. $\angle$'s $\cong$ Thm
$\angle 1 \cong \angle 3$	Transitive POC
$\angle 4 \cong \angle 3$	Transitive POC
$\overrightarrow{BG}$ bisects $\angle FBH$	Def. of Bisects

6. **Given:** The sum of the angle measures in a triangle is 180°.

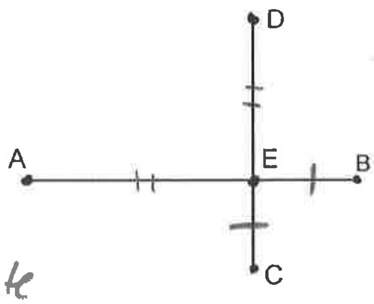
Prove: $m\angle 1 = m\angle 3 + m\angle 4$



S	R
$m\angle 2 + m\angle 3 + m\angle 4 = 180$	Given
$\angle 1$ + $\angle 2$ Linear Pair	Def. of Lin Pair
$\angle 1$ + $\angle 2$ Supp. $\angle$'s	Linear Pair Postulate
$m\angle 1 + m\angle 2 = 180$	Def. of Supp. $\angle$'s
$m\angle 1 + m\angle 2 = m\angle 2 + m\angle 3 + m\angle 4$	Transitive POE
$-m\angle 2 \quad -m\angle 2$	Subtraction POE
$m\angle 1 = m\angle 3 + m\angle 4$	Simplify

7. Given: $\overline{BE} \cong \overline{CE}$ and $\overline{DE} \cong \overline{AE}$

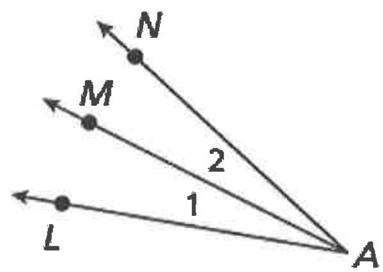
Prove: $\overline{AB} \cong \overline{CD}$



S	R
$\overline{BE} \cong \overline{CE}$, $\overline{DE} \cong \overline{AE}$	Given
$BE = CE$, $DE = AE$	Def. of $\cong$
$AE + EB = AB$, $DE + EC = CD$	Segment Add Postulate
$DE + EB = AB$	Sub (DE in for AE)
$DE + EC = AB$	sub (EC for EB)
$AB = CD$	Transitive POE
$\overline{AB} \cong \overline{CD}$	Def. of $\cong$

8. **Given: $m\angle LAN = 30°$, $m\angle 1 = 15°$**

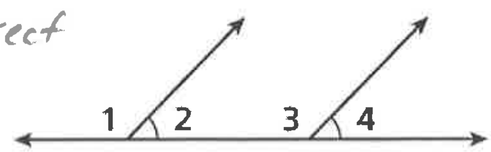
Prove: $\overrightarrow{AM}$ bisects $\angle LAN$.



S	R
$m\angle LAN = 30°$, $m\angle 1 = 15$	Given
$m\angle 1 + m\angle 2 = m\angle LAN$	$\angle$ Add. Postulate
$15 + m\angle 2 = m\angle LAN$	Sub
$15 + m\angle 2 = 30$	Sub
$-15 \quad -15$	subtraction POE
$m\angle 2 = 15$	simplify
$m\angle 1 = m\angle 2$	Transitive POE
$\angle 1 \cong \angle 2$	Def. of $\cong$
$\overrightarrow{AM}$ bisects $\angle LAN$	Def. of bisect

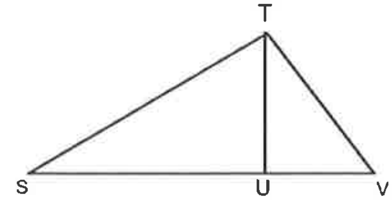
9. **Given: $\angle 2 \cong \angle 4$**

Prove: $m\angle 1 = m\angle 3$



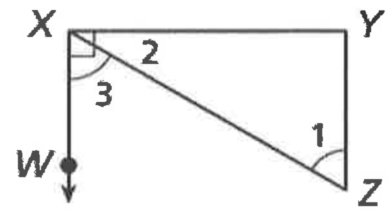
S	R
$\angle 2 \cong \angle 4$	Given
$\angle 1 + \angle 2$ Lin. Pairs, $\angle 3 + \angle 4$ Lin Pairs	Def. of Lin. Pairs
$\angle 1 + \angle 2$ supp. $\angle$'s, $\angle 3 + \angle 4$ supp. $\angle$'s	Linear Pair Postulate
$m\angle 2 = m\angle 4$	Def. of $\cong$
$m\angle 1 + m\angle 2 = 180$, $m\angle 3 + m\angle 4 = 180$	Def. of supp. $\angle$'s
$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$	Transitive POE
$m\angle 1 + m\angle 2 = m\angle 3 + m\angle 2$	Sub
$-m\angle 2 \quad -m\angle 2$	Subtraction POE
$m\angle 1 = m\angle 3$	Simplify

10. Given: $\overline{TU} \cong \overline{UV}$
Prove: SU + TU = SV



S	R
$\overline{TU} \cong \overline{UV}$	Given
$TU = UV$	Def. of $\cong$
$SU + UV = SV$	Segment Add. Postulate
$SU + TU = SV$	Substitution

11. **Given:** $\angle WXY$ **is a right angle.** $\angle 1 \cong \angle 3$
Prove: $\angle 1$ **and** $\angle 2$ **are complementary.**



S	R
$\angle WXY$ is right $\angle$; $\angle 1 \cong \angle 3$	Given
$m\angle WXY = 90$	Def. of Right $\angle$
$m\angle 1 = m\angle 3$	Def. of $\cong$
$m\angle 2 + m\angle 3 = m\angle WXY$	$\angle$ Addition Postulate
$m\angle 2 + m\angle 1 = m\angle WXY$	Sub
$m\angle 2 + m\angle 1 = 90$	Sub
$\angle 1$ and $\angle 2$ are comp. $\angle$'s	Def. of comp. $\angle$'s

12. Given: X is the midpoint of $\overline{AY}$
Y is the midpoint of $\overline{XB}$
Prove: $\overline{AX} \cong \overline{YB}$

S	R
X is mdpt of $\overline{AY}$	Given
Y is mdpt of $\overline{XB}$	Given
$\overline{AX} \cong \overline{XY}$, $\overline{XY} \cong \overline{YB}$	Def. of mdpt
$\overline{AX} \cong \overline{YB}$	Transitive POC