Name: KEY Date: _____ Block: _____

Geometry WS 2.6C Geometric Proof

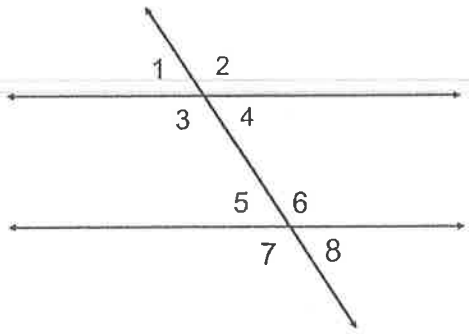
1. Given: X is the midpoint of $\overline{AY}$
   Y is the midpoint of $\overline{XB}$
   Prove: $\overline{AX} \cong \overline{YB}$

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

2. Given: $m\angle A = 60°$
   $m\angle B = 2(m\angle A)$
   Prove: $\angle A$ and $\angle B$ are supplementary

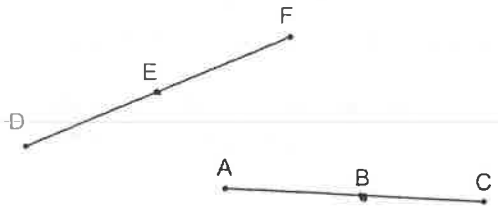
S	R
$m\angle A = 60$, $m\angle B = 2(m\angle A)$	Given
$m\angle B = 2(60)$	Sub
$m\angle B = 120$	Simplify
$m\angle A + m\angle B = m\angle A + 120$	Addition POE
$m\angle A + m\angle B = 60 + 120$	Sub
$m\angle A + m\angle B = 180$	Simplify
$\angle A$ and $\angle B$ are supp $\angle$'s	Def. of supp.

3. Given: $\angle 3$ and $\angle 5$ are supplementary angles.
   Prove: $\angle 2$ and $\angle 8$ are supplementary angles.



S	R
$\angle 3$ and $\angle 5$ are supp. $\angle$'s	Given
$m\angle 3 + m\angle 5 = 180$	Def. of supp.
$\angle 3 \cong \angle 2$	Vertical $\angle$'s Thm
$m\angle 3 = m\angle 2$	Def. of $\cong$
$m\angle 2 + m\angle 5 = 180$	Sub
$\angle 5 \cong \angle 8$	Vertical $\angle$'s Thm
$m\angle 5 = m\angle 8$	Def. of $\cong$
$m\angle 2 + m\angle 8 = 180$	Sub
$\angle 2$ and $\angle 8$ are supp. $\angle$'s	Def of Supp. $\angle$'s

4. Given: AB = EF, B is the midpoint of $\overline{AC}$
E is the midpoint of $\overline{DF}$
Prove: $\overline{AC} \cong \overline{DF}$

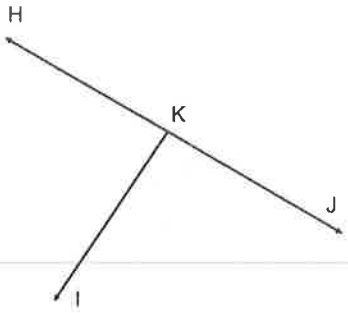


S	R
AB = EF, B midpoint of $\overline{AC}$	Given
E is midpoint of $\overline{DF}$	Given
$\overline{AB} \cong \overline{BC}$, $\overline{DE} \cong \overline{EF}$	Def. of $\cong$
AB = BC, DE = EF	Def. of $\cong$
EF = BC	Sub
BC = ED	Sub
AB + BC = AC, DE + EF = DF	Segment Add. Post
AB = EF	Given (Already stated)
AB + BC = EF + BC	Addition POE
AB + BC = EF + DE	Sub
AC = DF	Sub (x2)

$\overline{AC} \cong \overline{DF}$ Def. of $\cong$

5. Given: $\angle HKJ$ is a straight angle
$\overrightarrow{KI}$ bisects $\angle HKJ$

Prove: $\angle IKJ$ is a right angle.



S	R
$\angle HKJ$ is straight $\angle$	Given
$\overrightarrow{KI}$ bisects $\angle HKJ$	Given
$m\angle HKJ = 180$	Def. of Straight $\angle$
$\angle HKI \cong \angle JKI$	Def. of bisector
$m\angle HKI = m\angle JKI$	Def. of $\cong$
$m\angle HKI + m\angle JKI = m\angle HKJ$	Angle Add. Post
$m\angle HKI + m\angle JKI = 180^\circ$	Sub.
$m\angle JKI + m\angle JKI = 180$	Sub
$\frac{2(m\angle JKI)}{2} = \frac{180}{2}$	Simplify
$m\angle JKI = 90$	Div. POE
$\angle JKI$ is a right $\angle$	Simplify
	Def. of a right $\angle$