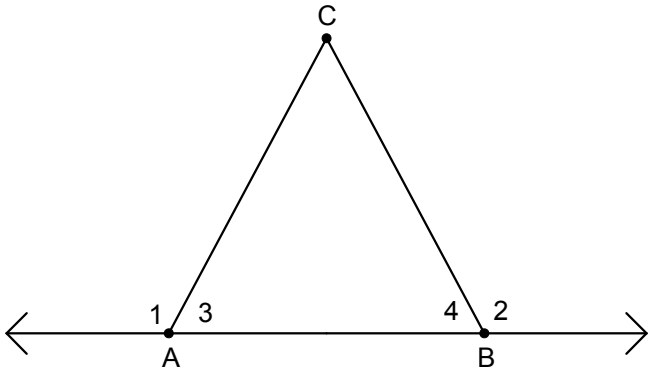
Geometry
Proof Worksheet (3)

Name:
Date:

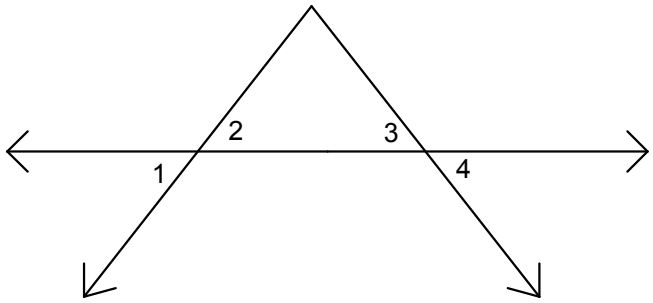
1. Given: $\angle 3 \cong \angle 4$

   Prove: $\angle 1 \cong \angle 2$



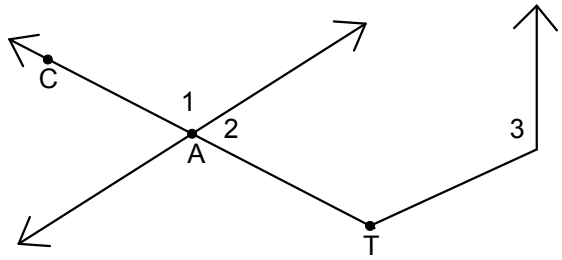
2. Given: $\angle 1 \cong \angle 4$

   Prove: $\angle 2 \cong \angle 3$



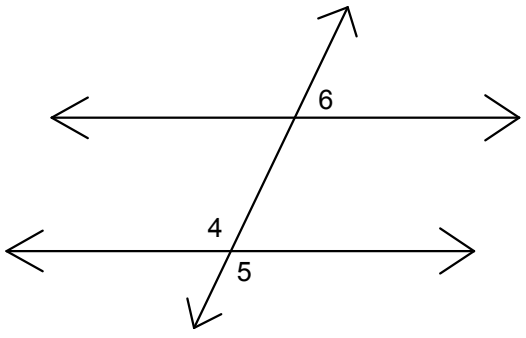
3. Given: $\angle 1 \cong \angle 3$

   Prove: $\angle 2$ is supplementary to $\angle 3$



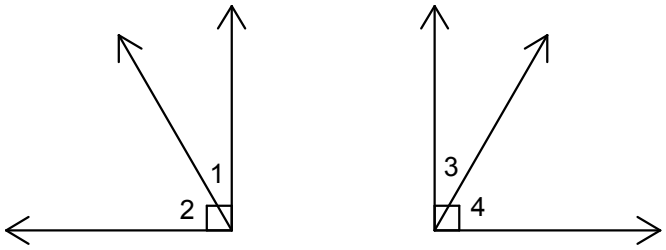
4. Given: $\angle 4 \cong \angle 6$

   Prove: $\angle 5 \cong \angle 6$



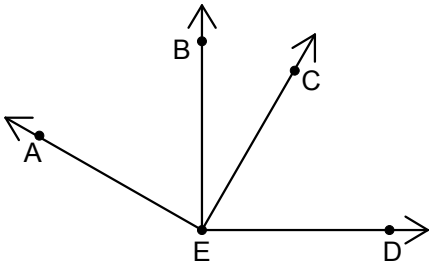
5. Given: $\angle 1 \cong \angle 3$

Prove: $\angle 2 \cong \angle 4$



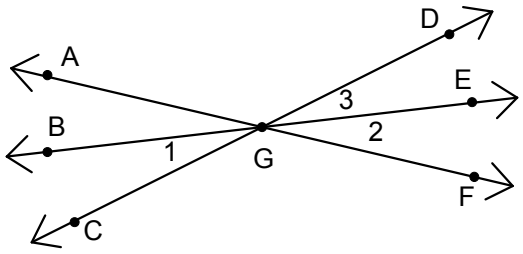
6. Given: $\angle AEC$ is a right angle
$\angle BED$ is a right angle

Prove: $\angle AEB \cong \angle DEC$



7. Given: $\overrightarrow{GE}$ bisects $\angle DGF$

Prove: $\angle 1 \cong \angle 2$



8. If a pair of vertical angles are supplementary, what can we conclude about the angles? Sketch a diagram that supports your reasoning?

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1. Given: $\angle 3 \cong \angle 4$

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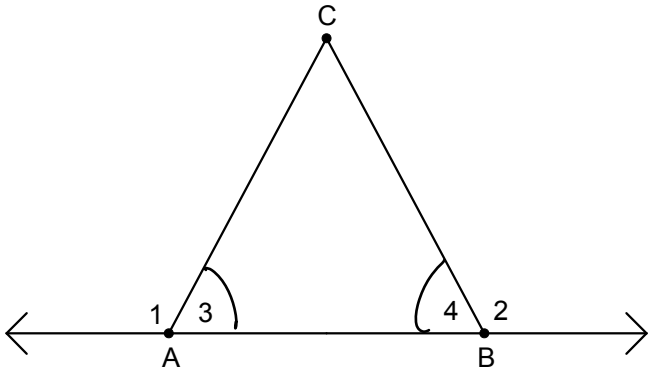
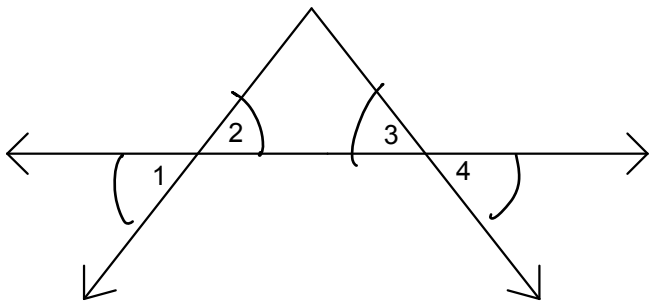


(1) $\angle 3 \cong \angle 4$	(1) given
(2) $\angle 1, \angle 3$ are L.P. $\angle 2, \angle 4$ are L.P.	(2) Diagram
(3) $\angle 1$ supp $\angle 3$ $\angle 2$ supp $\angle 4$	(3) If L.P., then supp.
(4) $\angle 1 \cong \angle 2$	(4) If 2 $\angle$'s are supp to $\cong$ $\angle$'s, then $\angle$'s $\cong$

2. Given: $\angle 1 \cong \angle 4$

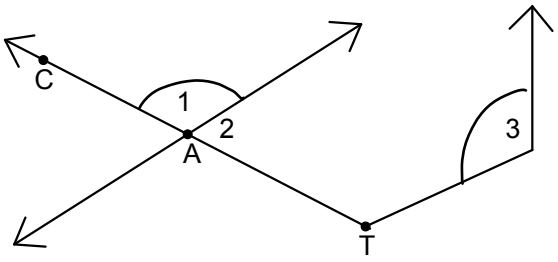
   Prove: $\angle 2 \cong \angle 3$



(1) $\angle 1 \cong \angle 4$	(1) given
(2) $\angle 1, \angle 2$ vertical $\angle$'s $\angle 3, \angle 4$ vertical $\angle$'s	(2) Diagram
(3) $\angle 1 \cong \angle 2$ $\angle 3 \cong \angle 4$	(3) Vertical $\angle$'s are $\cong$.
(4) $\angle 2 \cong \angle 3$	(4) Transitive Prop. ($\angle 2 \cong \angle 1 \cong \angle 4 \cong \angle 3$)

3. Given: $\angle 1 \cong \angle 3$

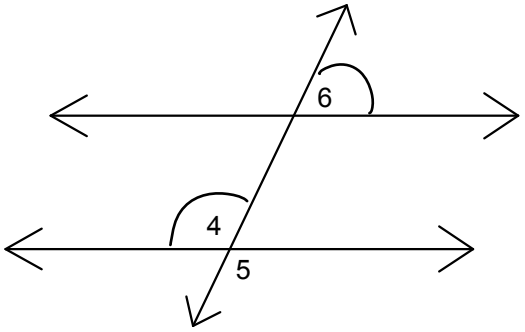
Prove: $\angle 2$ is supplementary to $\angle 3$



1) $\angle 1 \cong \angle 3$	1) given
2) $\angle 1, \angle 2$ are L.P.	2) Diagram
3) $\angle 1$ supp $\angle 2$	3) If L.P., then supp.
4) $\angle 3$ Supp $\angle 2$	4) Substitution or If 2 $\angle$'s are $\cong$, then supp to same $\angle$.

4. Given: $\angle 4 \cong \angle 6$

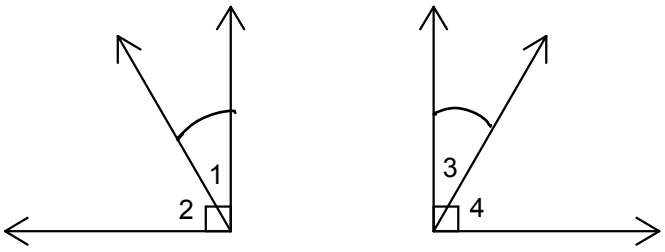
Prove: $\angle 5 \cong \angle 6$



1) $\angle 4 \cong \angle 6$	1) Given
2) $\angle 4$ & $\angle 5$ vertical $\angle$'s	2) Diagram
3) $\angle 4 \cong \angle 5$	3) Vertical $\angle$'s are $\cong$.
4) $\angle 5 \cong \angle 6$	4) Transitive Prop.

5. Given: $\angle 1 \cong \angle 3$

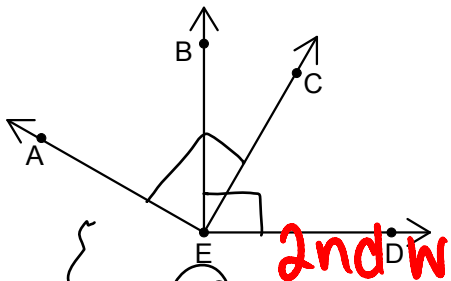
Prove: $\angle 2 \cong \angle 4$



1) $\angle 1 \cong \angle 3$	1) given
2) $\angle 1 + \angle 2 = 90°$ $\angle 3 + \angle 4 = 90°$	2) Diagram
3) $\angle 1$ comp $\angle 2$ $\angle 3$ comp $\angle 4$	3) If two angles form a right angle, then they are comp.
4) $\angle 2 \cong \angle 4$	4) If 2 $\angle$'s are comp to $\cong$ $\angle$'s, then they are $\cong$.

6. Given: $\angle AEC$ is a right angle
$\angle BED$ is a right angle

Prove: $\angle AEB \cong \angle DEC$



1) $\angle AEC$ is right $\angle$ $\angle BED$ is right $\angle$	1) given
2) $\angle AEC \cong \angle BED$	2) All right $\angle$'s are $\cong$.
3) $\angle BEC \cong \angle BEC$	3) Reflexive prop.
4) $\angle AEB \cong \angle DEC$	4) If the same $\angle$ is $-$ from $\cong$ $\angle$'s, then differences are $\cong$.

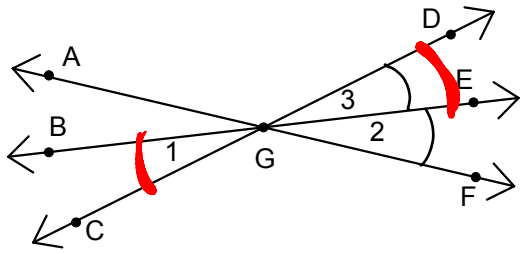
2nd way.

2) $\angle AEB$ comp $\angle BEC$
$\angle BEC$ comp $\angle CED$
(Right $\angle \Rightarrow$ comp)

3) $\angle AEB \cong \angle DEC$
($\angle$'s comp to same $\angle$ are $\cong$.)

7. Given: $\overrightarrow{GE}$ bisects $\angle DGF$

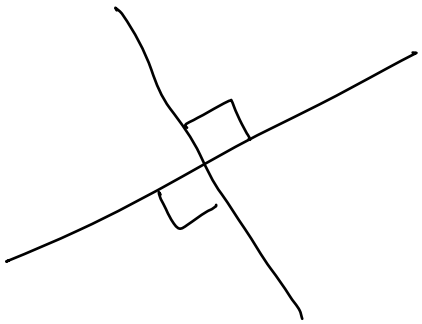
Prove: $\angle 1 \cong \angle 2$



(1) $\overrightarrow{GE}$ bisects $\angle DGF$	(1) given
(2) $\angle 2 \cong \angle 3$	(2) If $\angle$ bisected, then cut into 2 $\cong$ $\angle$'s.
(3) $\angle 1, \angle 3$ are vertical	(3) Diagram
(4) $\angle 1 \cong \angle 3$	(4) Vertical $\angle$'s are $\cong$.
(5) $\angle 1 \cong \angle 2$	(5) Transitive Prop.

Right $\angle$'s.

8. If a pair of vertical angles are supplementary, what can we conclude about the angles? Sketch a diagram that supports your reasoning?



Vertical → $\cong$

Supp → $180°$

$x + x = 180$

$2x = 180$

$x = 90°$