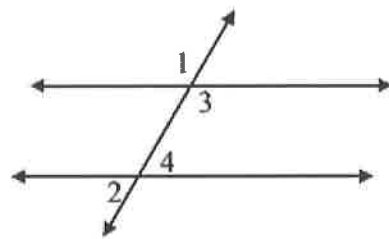


WS Geometric Proof 4

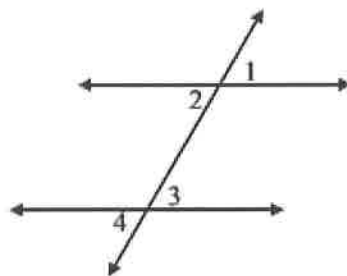
1. Given:  $\angle 1$  and  $\angle 2$  are supplementary.  
 Prove:  $\angle 3$  and  $\angle 4$  are supplementary.



S  
 $\angle 1$  and  $\angle 2$  are supp.  $\angle$ 's  
 $\angle 1$  and  $\angle 3$  are vertical  $\angle$ 's  
 $\angle 2$  and  $\angle 4$  are vert.  $\angle$ 's  
 $\angle 1 \cong \angle 3$ ,  $\angle 2 \cong \angle 4$   
 $m\angle 1 = m\angle 3$ ,  $m\angle 2 = m\angle 4$   
 $m\angle 1 + m\angle 2 = 180$   
 $m\angle 3 + m\angle 2 = 180$   
 $m\angle 3 + m\angle 4 = 180$   
 $\angle 3$  and  $\angle 4$  are supp.  $\angle$ 's

R  
 Given  
 > Def. of vert.  $\angle$ 's  
 Vert.  $\angle$ 's Thm  
 Def. of  $\cong$   
 Def of Supp.  $\angle$ 's  
 sub  
 sub  
 Def. of supp.

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



S  
 $\angle 2 \cong \angle 3$   
 $\angle 1 + \angle 2$  vert.  $\angle$ 's  
 $\angle 3 + \angle 4$  vert.  $\angle$ 's  
 $\angle 1 \cong \angle 2$ ,  $\angle 3 \cong \angle 4$   
 $\angle 1 \cong \angle 3$   
 $\angle 1 \cong \angle 4$

R  
 Given  
 > Def. of vert.  $\angle$ 's  
 Vert.  $\angle$ 's  $\cong$  Thm  
 Transitive POE  
 Transitive POE

3. Given:  $AB = CD$   
 Prove:  $AC = BD$



S  
 $AB = CD$   
 $AB + BC = BC + CD$   
 $AB + BC = AC$ ,  $BC + CD = BD$   
 $AC = BD$

R  
 Given  
 Addition POE  
 Segment Add. Postulate  
 Transitive POE

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

Prove:  $\angle 1$  and  $\angle 2$  are right angles.



S

$\angle 1 \cong \angle 2$   
 $m\angle 1 = m\angle 2$   
 $\angle 1$  &  $\angle 2$  Form Lin. Pair  
 $\angle 1$  &  $\angle 2$  Supp. L's  
 $m\angle 1 + m\angle 2 = 180$   
 $m\angle 1 + m\angle 1 = 180$   
 $2(m\angle 1) = 180$   
 $m\angle 1 = 90$   
 $m\angle 2 = 90$   
 $\angle 1$  &  $\angle 2$  are right  $\angle$ 's

5. Given:  $\angle 2 \cong \angle 3$

Prove:  $\angle 1 \cong \angle 4$

S  
 $\angle 2 \cong \angle 3$

$\angle 1$  &  $\angle 2$ ,  $\angle 3$  &  $\angle 4$  Form Lin. Pair  
 $\angle 1$  &  $\angle 2$  supp. L's,  $\angle 3$  &  $\angle 4$  supp. L's  
 $m\angle 1 + m\angle 2 = 180$ ,  $m\angle 3 + m\angle 4 = 180$   
 $m\angle 1 + m\angle 2 = m\angle 3 + m\angle 4$   
 $m\angle 2 = m\angle 3$   
 $m\angle 1 + m\angle 2 = m\angle 2 + m\angle 4$   
 $-m\angle 2 \quad -m\angle 2$   
 $m\angle 1 = m\angle 4$   
 $\angle 1 \cong \angle 4$

6. Given:  $\overrightarrow{BD}$  bisects  $\angle EBC$

Prove:  $\angle 1$  and  $\angle 3$  are supplementary

S  
 $\overrightarrow{BD}$  bisects  $\angle EBC$   
 $\angle 1 \cong \angle 2$

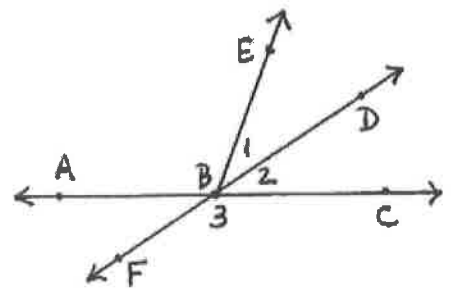
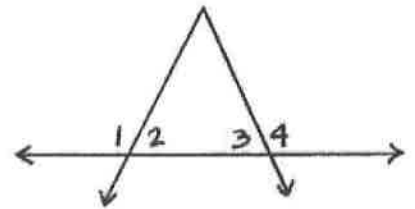
$\angle 2$  &  $\angle 3$  form lin. pair  
 $\angle 2$  and  $\angle 3$  are supp. L's  
 $m\angle 2 = m\angle 3$   
 $m\angle 2 + m\angle 3 = 180$   
 $m\angle 1 + m\angle 3 = 180$   
 $\angle 1$  &  $\angle 3$  are supp. L's

R

Given  
 Def. of  $\cong$   
 Def. of Lin. Pair  
 Lin. Pair Post  
 Def. of supp.  
 sub  
 simplify  
 Division POE  
 Transitive POE  
 Def. of right  $\angle$

R

Given  
 Def. of Linear Pair  
 Linear Pair Postulate  
 Def. of Supp. L's  
 Transitive POE  
 Def. of  $\cong$  (From Step 1)  
 sub  
 subtraction POE  
 simplify  
 Def. of  $\cong$



Given  
 Def. of bisect  
 Def. of Lin. Pair  
 Lin. Pair Postulate  
 Def. of  $\cong$  (From Step 2)  
 Def. of supp. L's  
 sub  
 Def. of supp. L's