

Write a two-column proof for each of the following.

1. Theorem: If two angles are supplementary to the same angle then they are congruent.

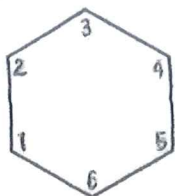
Given:  $\angle 3$  and  $\angle 4$  are supplementary;  $\angle 3$  and  $\angle 5$  are supplementary

Prove:  $\angle 4 \cong \angle 5$

1. $\angle 3$ and $\angle 4$ are suppl. $\angle 3$ and $\angle 5$ are suppl.	1. given
2. $\angle 3 + \angle 4 = 180$ , $\angle 3 + \angle 5 = 180$	2. def of suppl.
3. $\angle 3 + \angle 4 = \angle 3 + \angle 5$	3. substitution
4. $\angle 4 \cong \angle 5$	4. subtraction

2. Given:  $m\angle 3 = 120^\circ$ ;  $\angle 1 \cong \angle 4$ ;  $\angle 3 \cong \angle 4$

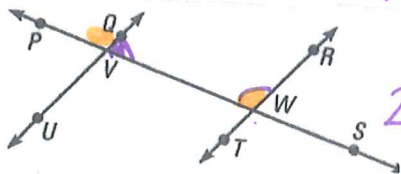
Prove:  $m\angle 1 = 120^\circ$



1. $\angle 3 = 120$ $\angle 1 \cong \angle 4$ $\angle 3 \cong \angle 4$	1. given
2. $\angle 4 = 120^\circ$	2. substitution
3. $\angle 1 = 120^\circ$	3. substitution

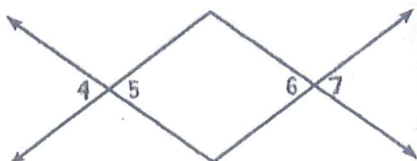
Write a two column proof for the following.

3. Given:  $\angle QVW$  and  $\angle RWV$  are supplementary  
 Prove:  $\angle QVP \cong \angle RWV$



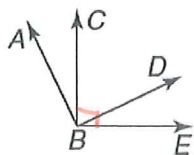
1. $\angle QVW$ and $\angle RWV$ are suppl.	1. given
2. $\angle QVW + \angle RWV = 180$	2. def of suppl.
3. $\angle QVP + \angle QVW = 180$	3. linear pairs are suppl.
4. $\angle QVP + \angle QVW = \angle QVW + \angle RWV$	4. substitution
5. $\angle QVP \cong \angle RWV$	5. subtraction

4. Given:  $\angle 5 \cong \angle 6$   
 Prove:  $\angle 4 \cong \angle 7$



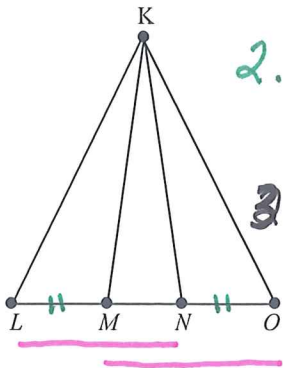
1. $\angle 5 \cong \angle 6$	1. given
2. $\angle 4 \cong \angle 5$ $\angle 6 \cong \angle 7$	2. Vertical $\angle$ ARE $\cong$ must have this part!
3. $\angle 4 \cong \angle 7$	3. Substitution

5. Given:  $\angle ABC$  and  $\angle CBD$  are complementary.  
 $\angle DBE$  and  $\angle CBD$  form a right angle.  
 Prove:  $\angle ABC \cong \angle DBE$



1. $\angle ABC$ and $\angle CBD$ are compl. $\angle DBE$ and $\angle CBD$ form a Right $\angle$	1. given
2. $\angle ABC + \angle CBD = 90$	2. def of compl.
3. $\angle DBE + \angle CBD = \angle CBE$	3. angle addition
4. $\angle CBE = 90$	4. def of RT $\angle$
5. $\angle DBE + \angle CBD = 90$	5. Substitution
6. $\angle ABC + \angle CBD = \angle DBE + \angle CBD$	6. Substitution
7. $\angle ABC \cong \angle DBE$	7. subtraction

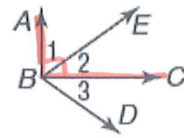
6. Given:  $\overline{LM} \cong \overline{NO}$   
 Prove:  $\overline{LN} \cong \overline{MO}$ .



1.  $LM \cong NO$
2.  $LN = LM + MN$   
 $MO = MN + NO$
3.  $LN = NO + MN$   
 $MO = NO + MN$
4.  $LN \cong MO$

1. given
2. Segment addition
3. substitution
4. Substitution

7. Given:  $\overline{AB} \perp \overline{BC}$  and  $\angle 1$  and  $\angle 3$  are complementary  
 Prove:  $\angle 2 \cong \angle 3$



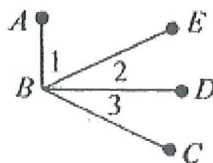
1.  $AB \perp BC$ ,  $\angle 1$  and  $\angle 3$  are compl.
2.  $\angle 1 + \angle 3 = 90^\circ$
3.  $\angle ABC = 90^\circ$
4.  $\angle 1 + \angle 2 = \angle ABC$
5.  $\angle 1 + \angle 2 = 90^\circ$
6.  $\angle 1 + \angle 2 + \angle 1 + \angle 3$
7.  $\angle 2 \cong \angle 3$

1. given
2. def of compl.
3. def of  $\perp$
4. angle addition
5. Substitution
6. Substitution
7. subtraction

lots of students miss this. You must name these two separate

8. Given:  $\overline{AB} \perp \overline{BD}$   
 $\overline{BD}$  bisects  $\angle EBC$ .

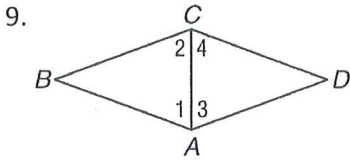
Prove:  $\angle 1$  and  $\angle 3$  are complements.



1.  $AB \perp BD$ ,  $\overline{BD}$  bisects  $\angle EBC$
2.  $\angle ABD = 90^\circ$
3.  $\angle 2 \cong \angle 3$
4.  $\angle 1 + \angle 2 = \angle ABD$
5.  $\angle 1 + \angle 2 = 90^\circ$
6.  $\angle 1 + \angle 3 = 90^\circ$
7.  $\angle 1$  and  $\angle 3$  are compl.

1. given
2. def of  $\perp$
3. def of  $\angle$  bisector
4. angle addition
5. substitution
6. substitution
7. def of compl.

Must name



**Given:**  $AC$  bisects  $\angle BAD$ .

$AC$  bisects  $\angle BCD$ .

$\angle 1 \cong \angle 2$

**Prove:**  $\angle 3 \cong \angle 4$

1.  $AC$  Bisects  $\angle BAD$   
 $AC$  Bisects  $\angle BCD$

$\angle 1 \cong \angle 2$

2.  $\angle 2 \cong \angle 4$ ,  $\angle 1 \cong \angle 3$

3.  $\angle 3 \cong \angle 4$

1. given

2. def of  $\angle$  bisector

3. substitution

10. **Given:**  $\overline{AB} \cong \overline{CD}$

**Prove:**  $\overline{AC} \cong \overline{BD}$



on next  
Page

11. **Given:**  $C$  is the midpoint of  $BD$  and  $AE$ .

**Prove:**  $\overline{AB} \cong \overline{DE}$



Name: \_\_\_\_\_

ID: A

Complete the two  
Proofs as a warm up

Short Answer

Write a proof for each of the following.

1.)

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

Prove:  $\overline{AC} \cong \overline{BD}$

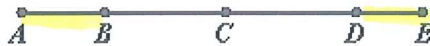


1. $\overline{AB} \cong \overline{CD}$	1. given
2. $\overline{AC} = \overline{AB} + \overline{BC}$ $\overline{BD} = \overline{BC} + \overline{CD}$	2. segment addition
3. $\overline{AC} = \overline{CD} + \overline{BC}$	3. substitution
4. $\overline{AC} \cong \overline{BD}$	4. substitution

2.)

Given: C is the midpoint of BD and AE.

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



1.	1.
2. $\overline{BC} \cong \overline{CD}$ $\overline{AC} \cong \overline{CE}$	2. def of midpoint
3. $\overline{AC} = \overline{AB} + \overline{BC}$ $\overline{CE} = \overline{CD} + \overline{DE}$	3. seg. add.
4. $\overline{AB} + \overline{BC} = \overline{CD} + \overline{DE}$	4. substitution
5.) $\overline{AB} + \overline{BC} = \overline{BC} + \overline{DE}$	5. substitution
6. $\overline{AB} \cong \overline{DE}$	6. subtraction

## Practice 2.7 and 2.8 Again ☺

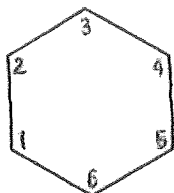
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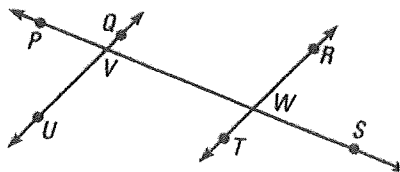
**Prove:**  $\angle 4 \cong \angle 5$

2. Given:  $m\angle 3 = 120^\circ$ ;  $\angle 1 \cong \angle 4$ ;  $\angle 3 \cong \angle 4$   
Prove:  $m\angle 1 = 120^\circ$

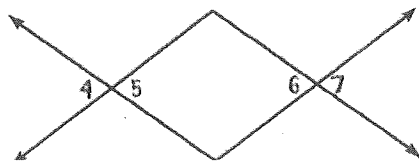


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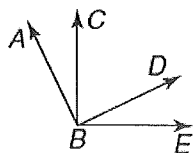
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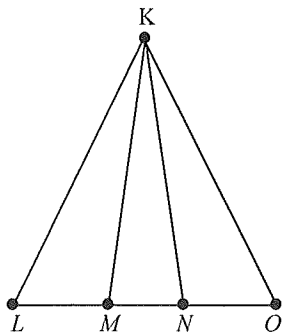
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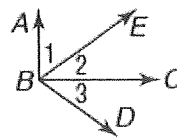
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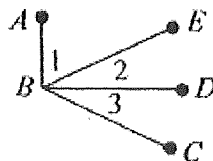


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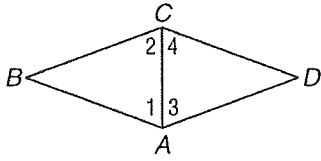
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Prove:  $\angle 1$  and  $\angle 3$  are complements.





9.



**Given:**  $AC$  bisects  $\angle BAD$ .

$AC$  bisects  $\angle BCD$ .

$\angle 1 \cong \angle 2$

**Prove:**  $\angle 3 \cong \angle 4$

10. **Given:**  $\overline{AB} \cong \overline{CD}$

**Prove:**  $\overline{AC} \cong \overline{BD}$



11. **Given:** C is the midpoint of BD and AE.

**Prove:**  $\overline{AB} \cong \overline{DE}$

