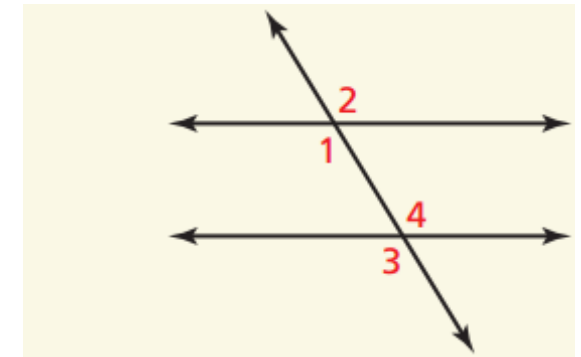
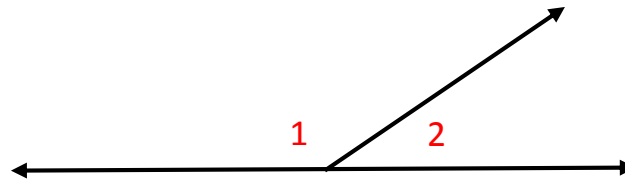
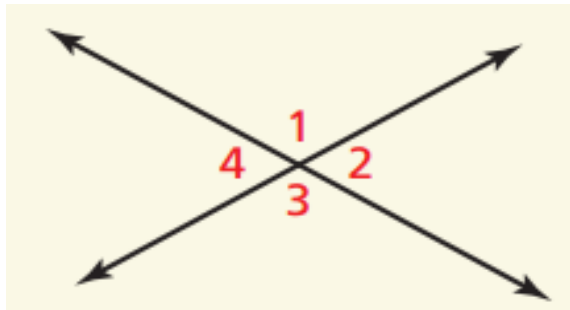


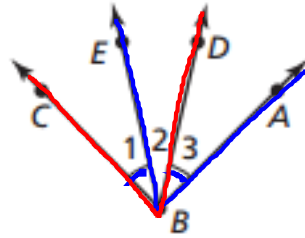
# Proving Geometric Relationships

## Lesson 2.6



Given  $m\angle 1 = m\angle 3$

Prove  $m\angle EBA = m\angle CBD$



$$m\angle 1 = m\angle 3$$

given

$$m\angle EBA = m\angle 2 + m\angle 3$$

angle add post.

$$m\angle EBA = m\angle 2 + m\angle 1$$

Substitution

$$m\angle EBA = m\angle 1 + m\angle 2$$

Commutative

$$m\angle 1 + m\angle 2 = m\angle CBD$$

angle add post.

$$m\angle EBA = m\angle CBD$$

Transitive

| Statements                            | Reasons         |
|---------------------------------------|-----------------|
| $m\angle 1 = m\angle 3$               | given           |
| $m\angle EBA = m\angle 2 + m\angle 3$ | angle add. post |
| $m\angle EBA = m\angle 2 + m\angle 1$ | Substitution    |
| $m\angle EBA = m\angle 1 + m\angle 2$ | assoc. prop +   |
| $m\angle 1 + m\angle 2 = m\angle CBD$ | angle add post. |
| $m\angle EBA = m\angle CBD$           | Transitive      |

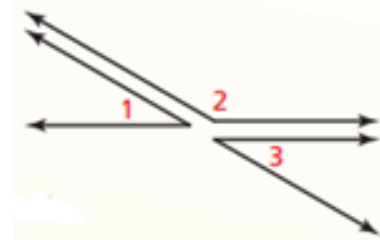
5 minutes

Open your book to p. 106 (p. 61 of Journal). Write the following theorems.

Right Angles Congruence Theorem - all right angles are  $\cong$

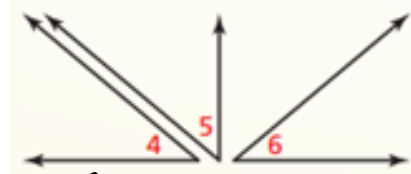
Congruent Supplements Theorem - if 2  $\angle$ s are supplementary to the same  $\angle$  (or  $\cong \angle$ s) then they are  $\cong$ .

$\angle 1$  &  $\angle 2$  are Suppl  
 $\angle 2$  &  $\angle 3$  are Suppl.  
 $\angle 1 \cong \angle 3$



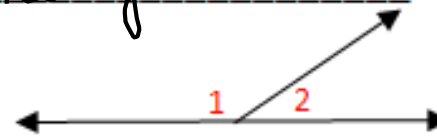
Congruent Complements Theorem - if 2  $\angle$ s are complementary to the same  $\angle$  (or  $\cong \angle$ s) then they are  $\cong$

$\angle 4$  &  $\angle 5$  are compl  
 $\angle 5$  &  $\angle 6$  are compl  
 $\angle 4 \cong \angle 6$



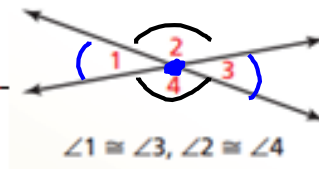
Linear Pair Postulate - If 2  $\angle$ s form a linear pair then they are supplementary.

$\angle 1$  &  $\angle 2$  are Suppl  
 $m\angle 1 + m\angle 2 = 180^\circ$



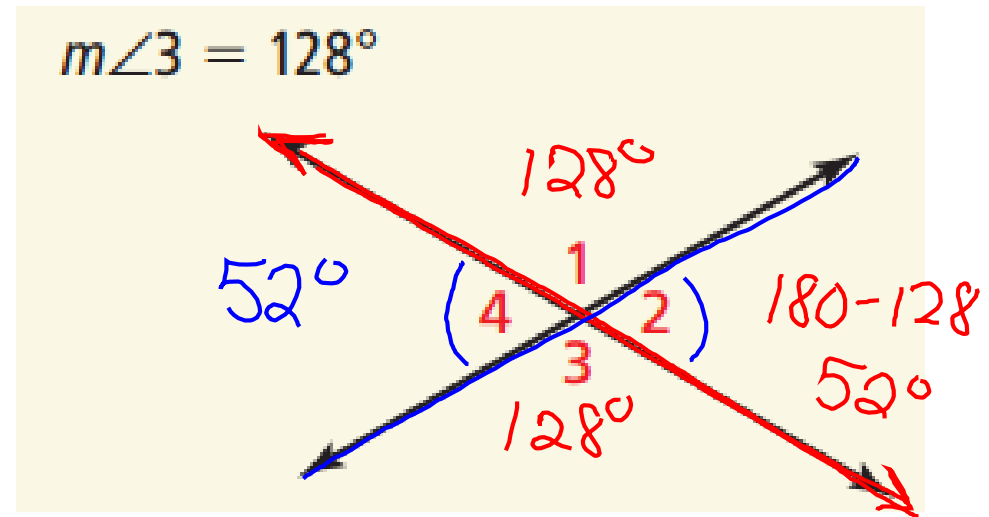
Vertical Angles Congruence Theorem -

Vertical  $\angle$ s are  $\cong$



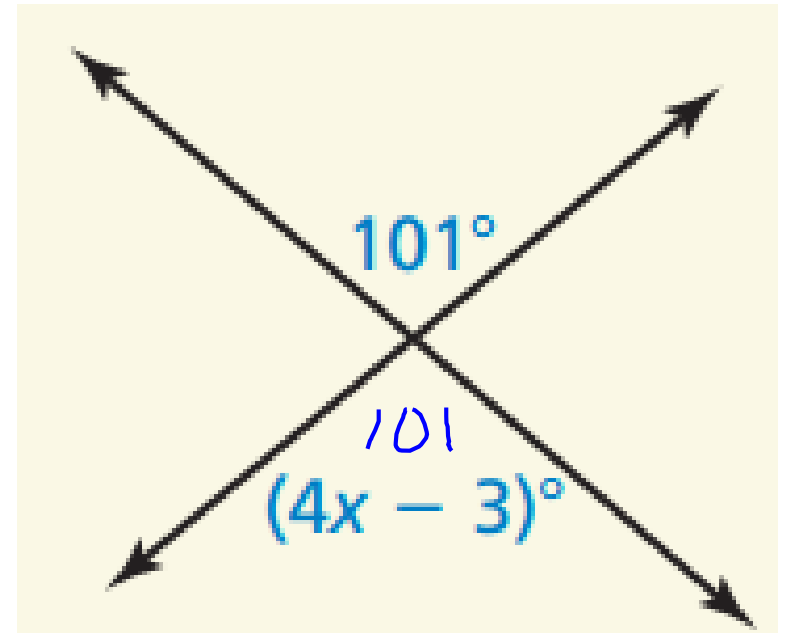
Use the diagram and the given angle measure to find the other three angle measures.

$$m\angle 1 = 128^\circ$$



Find the value of x.

$$\begin{array}{r} 4x - 3 = 101 \\ + 3 \quad + 3 \\ \hline 4x = 104 \\ \frac{4x}{4} = \frac{104}{4} \\ x = 26 \end{array}$$

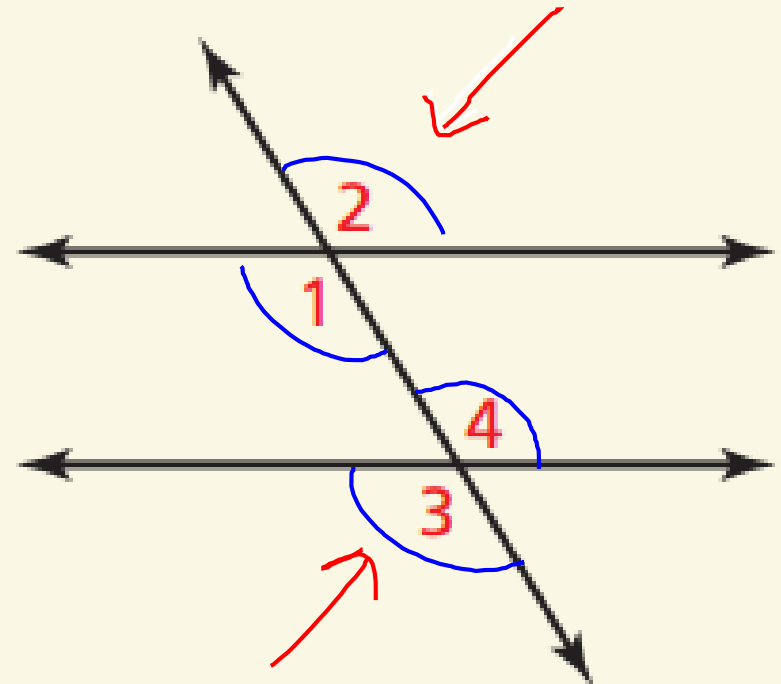


Write a paragraph proof.

We're given that  $\angle 1 \cong \angle 4$ .  
 $\angle 1 \cong \angle 2$  by vertical  $\angle$  thm.  
 $\angle 4 \cong \angle 2$  by substitution.  
 $\angle 4 \cong \angle 3$  by vertical  $\angle$  thm  
 $\angle 2 \cong \angle 3$  by substitution

**Given**  $\angle 1 \cong \angle 4$

**Prove**  $\angle 2 \cong \angle 3$



# Key Ideas from Last Chapter

- Angle Addition Postulate
- Definition of Angle Bisector
- Linear Pair Postulate
- Definition of Complementary
- Definition of Supplementary
- Definition of Vertical Angles
- Segment Addition Postulate
- Definition of Segment Bisector
- Definition of Midpoint
- Definition of Perpendicular
- Definition of Congruence

8)  $m\angle 1 = 8x - 2$        $m\angle 2 = 4x + 14$

If you are having trouble remembering these or don't know when to use them in proofs, it may be a good idea to refresh your memory by defining them on the outside of the notes sheet from today.

Lesson 2.6 p. 111 #s 1, 2, 6-22 even, 27, 29,  
31-36