**Summary of Postulates and Theorems from Section 2.1**

If two parallel lines are cut by a transversal, then

➢ Each pair of corresponding angles are congruent $\angle 1 \cong \angle 5, \ 2 \cong 2 \cong \angle 6, \ \angle 3 \cong \angle 7, \angle 4 \cong \angle 8$

➢ Each pair of alternate interior angles are congruent $\angle 3 \cong \angle 5, \ \angle 4 \cong \angle 6$

➢ Each pair of alternate exterior angles are congruent $\angle 1 \cong \angle 7, \ \angle 2 \cong \angle 8$

➢ Each pair of interior angles on the same side of the transversal are supplementary
$\angle 3 + \angle 6 = 180, \ \angle 4 + \angle 5 = 180^\circ$

➢ Each pair of exterior angles on the same side of the transversal are supplementary
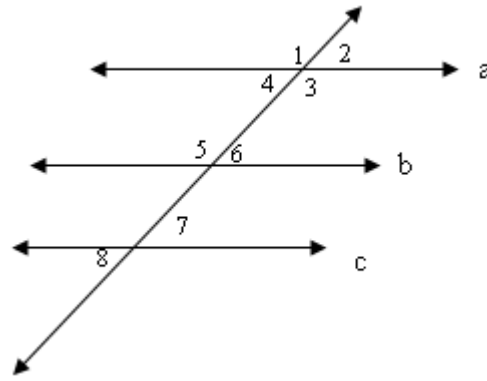$\angle 2 + \angle 7 = 180^\circ \quad \angle 1 + \angle 8 = 180^\circ$

Example:
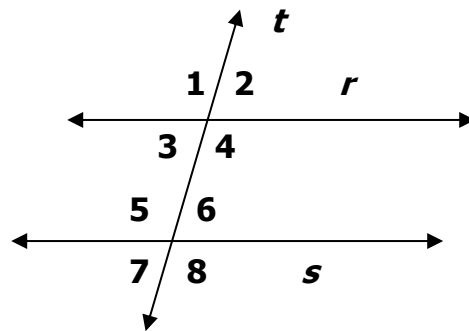
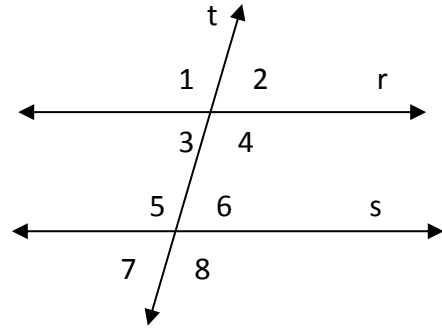Example 1: Use the figure below. If the measure of $\angle 4 = 48°$. Find the measure angles 1-3 and 5-8.

$$\begin{array}{r} 180 \\ -48 \\ \hline 132 \end{array}$$
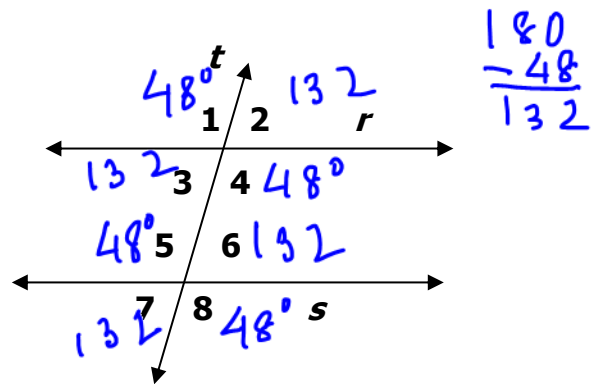
Proof:

Given: $a \parallel b, b \parallel c$

Prove: $\angle 2 \cong \angle 8$

St	R
1) $a \parallel b$ $b \parallel C$	Given
2) $a \parallel C$	Trans
3) $m\angle 2 = m\angle 7$	Coresspongding $\angle s$
4) $m\angle 8 = m\angle 7$	V. A
5) $m\angle 2 = m\angle 8$	Transitive
$\angle 2 \cong \angle 8$	

Example 2:

a. If the **m∠5 = 3x + 13** and **m∠8 = 4x + 3**. Find the value of x and the measure of **m∠5** and ∠**6**.

$$m\angle 5 = m\angle 8 \quad (V. A)$$
$$3x + 13 = 4x + 3$$
$$13 - 3 = 4x - 3x$$
$$10 = x$$

$$m\angle 5 = 3 \cdot 10 + 13$$
$$= 43^\circ$$
$$m\angle 5 + m\angle 6 = 180^\circ$$
$$m\angle 6 = 180^\circ - 43^\circ$$
$$= 137^\circ$$

b.   If the **m∠3 = 7x − 10** and **m∠5 = 70 − x**. **Find the value of x and the measure of m∠3 and ∠5.**

$$m\angle 3 + m\angle 5 = 180^\circ$$
$$7x - 10 + 70 - x = 180$$
$$6x + 60 = 180$$
$$6x = 180 - 60$$
$$6x = 120$$
$$x = 20$$

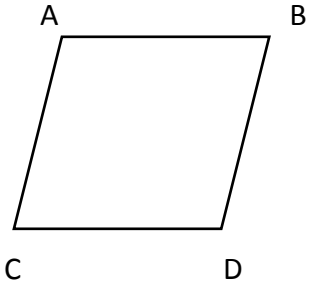$$m\angle 3 = 7 \cdot 20 - 10$$
$$= 130^\circ$$
$$m\angle 5 = 70^\circ - 20^\circ$$
$$= 50^\circ$$

Example 3: a. Given: AC || BD and AB || DC Which angle(s) measure the same as ∠ B ? ∠ C

b. If ∠ A = 4x + 2 and ∠ B = 4x − 2 Find the measure of all angles .

A   B

C   D

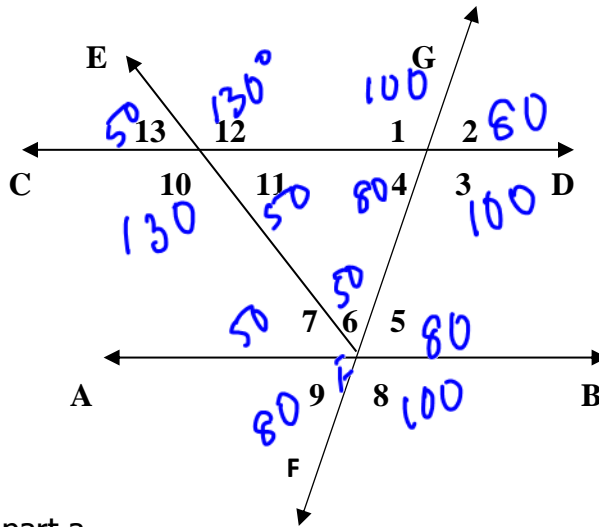$$m\angle A + m\angle B = 180°$$

$$4x + 2 + 4x - 2 = 180$$

$$8x = 180°$$

∠A ≅ ∠D

∠B ≅ ∠C

$$x = \frac{180}{8} = 22.5°$$

Example 4:

$$\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$$

$$\overleftarrow{EF} \text{ bisects } \angle AFG$$

E

G

50 13   130   100   60
       12   1   2
C   10   11   4   3   D
   130   50   80   100

50   7 6 5   80
80 9   8 100

A   B

F

Find the measures of angles 1-13 for part a

a. Given $m\angle 1 = 100°$

B. Given: $m\angle 3 = 4x - 9$

$$m\angle 5 = x + 19$$

OK, you Try these: p. 75 # 27 and 29