1.) Solve and prove the following equation.

Solve: $3x + 2 - 5x = 4x - 16$

$3x+2-5x=4x-16$

$-2x+2=4x-16$

$+2x \quad +2x$

$2=6x-16$

$18=6x$

$3=x$

$x=3$

Reason/Justification:

Given

Simp.

Add. PROP.

" "

Division.

Symmetric Prop.

For 2 – 7, name the property that justifies each statement.

2. $\angle D \cong \angle D$ — Refl. prop of C.

3. If $x = 3$ and $2x + y = 7$, then $2(3) + y = 7$. — Subst. prop of E.

4. If $2x - 15 = 30$, then $2x = 45$. — Add prop of E.

5. If $\overline{AB} \cong \overline{XY}$, then $\overline{XY} \cong \overline{AB}$. — Symm prop. of C.

6. If $\frac{x}{3} = 9$, then $x = 27$. — mult. prop of E.

7. If $a = b$ and $b = c$, then $a = c$. — transitive PROP.

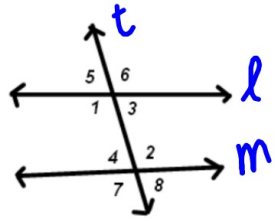
Geometry **3-1: Properties of Parallel Lines**

Objective 1: You will be able to identify angles formed by two lines and a transversal.

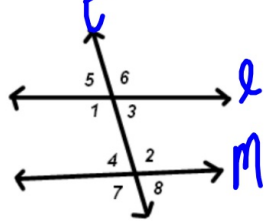
A transversal is a line that intersects two coplanar lines at two distinct (different) points.
The diagrams below show the eight angles formed by a transversal t and two lines ℓ & m.

Pairs of the eight angles have special names as suggested by their positions.

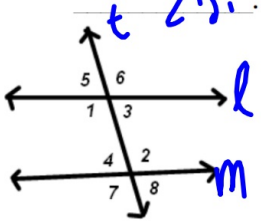
∠1 and ∠2 are alt. interior angles.



∠1 and ∠4 are same side interior.



∠1 and ∠7 are corresponding ∠'s.



Example 1: Identifying Angles

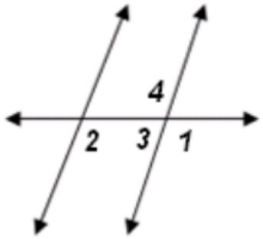
A. Name three other pairs of corresponding angles in the diagrams above.

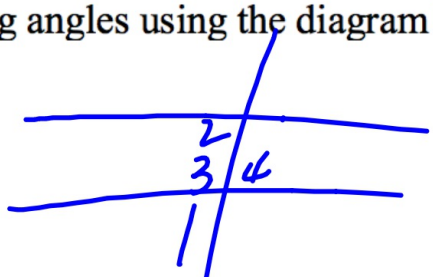
∠3 & ∠8

∠6 & ∠2

∠5 & ∠4

B. Classify the following angles using the diagram below.





∠1 and ∠2: corr. ∠'s

∠2 and ∠3: same side int.

∠2 and ∠4: alt. int. ∠'s

Tips to remember each type of angle.

Corresponding: occur in the similar/same spot/location.

Alternate Interior: Alternate: opp. side of transversal
interior: inside ∥ lines.

Same-side Interior:

Int: inside the ∥ lines.
Same side: same side of transversal.

Tips to remember each type of angle.

Corresponding:

Alternate Interior:

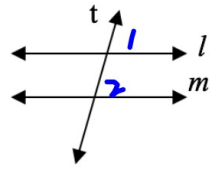
Same-side Interior:

Objective 2: You will be able to identify & understand properties of parallel lines.

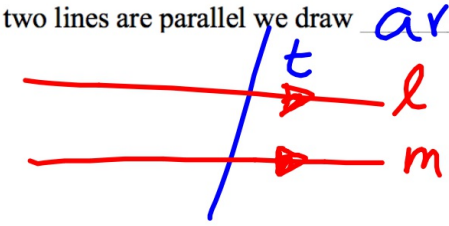
Postulate 3-1: Corresponding Angles Postulate

If a transversal intersects two parallel lines, then corr. ∠'s are ≅.

$\angle 1 \cong \angle 2$



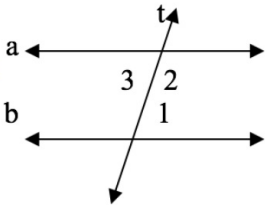
In a diagram, to show that two lines are parallel we draw arrows on the lines. Let's show that below:



ℓ ∥ m

Theorem 3-1: Alternate Interior Angles Theorem
If a transversal intersects two parallel lines, then alt int. ∠'s are ≅.

∠1 ≅ ∠3

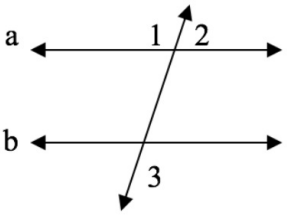


Theorem 3-2: Same-Side Interior Angles Theorem
If a transversal intersects two parallel lines, then same side int. ∠'s are supp.

m∠1 + m∠2 = 180

Theorem 3-3: Alternate Exterior Angles Theorem
If a transversal intersects two parallel lines, then alt. ext. ∠'s are ≅

∠1 ≅ ∠3



Theorem 3-4: Same-Side Exterior Angles Theorem
If a transversal intersects two parallel lines, then

m∠2 + m∠3 = 180° same side ext ∠'s are suppl.

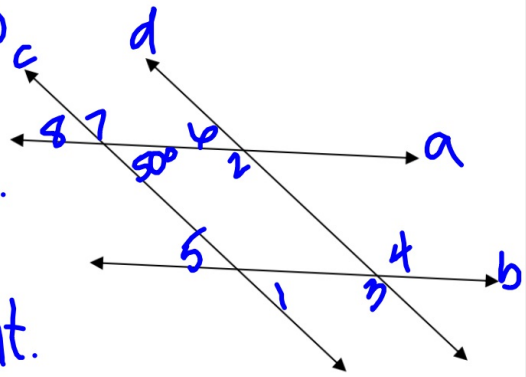
Example 3: Finding Measures of Angles

A. Find $m\angle 1$ and then $m\angle 2$. Which theorem or postulate justifies each answer?

since a||b

$m\angle 1 = 50°$ corr. $\angle$'s

$m\angle 2 = 130$ same side int.



B. Find the measure of each angle. Justify each answer.

a. $\angle 3$ $= 130$ corr $\angle$'s

b. $\angle 4$ 130 vert. $\angle$'s.

c. $\angle 5$ 50 alt. int. $\angle$'s

d. $\angle 6$ 50 alt int.

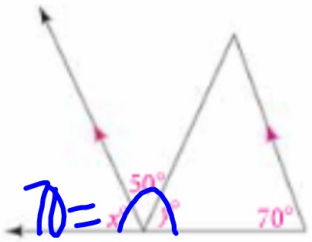
e. $\angle 7$ 130 Same side int.

f. $\angle 8$ 50 vert./corr $\angle$'s

Using Algebra to find Angle Measures:

Example 4: Find the value of each variable in the diagrams.

A. Find the value of x and y in the diagram

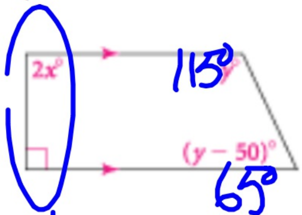


$70 + 50 + y = 180$

$y = 60°$ → Angle Add post.

70 = b/c corrs. Angles

B. Find the values of x and y. Then find the measures of the angles. (Hint: Find the value of x first.)



same side int = 180

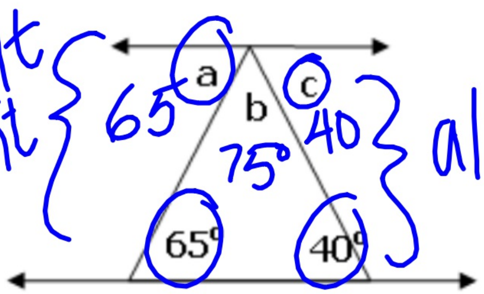
$x = 45°$

$2y - 50 = 180$

$2y = 230$

$y = 115°$

C. Find the measures of angle a, b and c.



Hwk #12 - due tomorrow

Sec. 3-1

Pages: 131-133

Problems: 2-4, 9, 13, 15, 24, 25, 42-44

IXL #6 - C.8 & I.6 due Friday, Oct. 12th at 4pm!