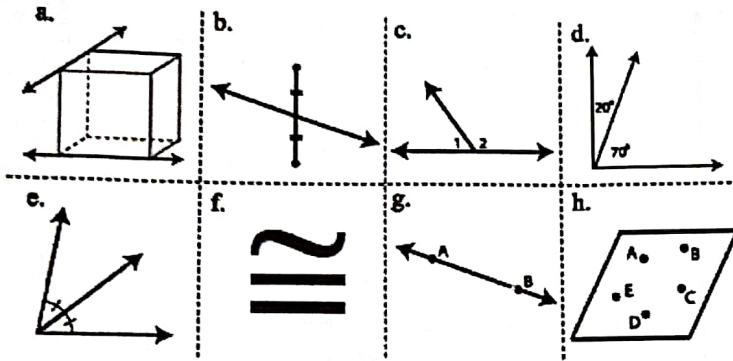


# 5.1 Intro to Geometric Properties

EQ: How do we examine the properties of lines and angles?

Directions: Match each of the following pictures with the vocabulary listed below.



1. G Line AB
2. C Linear Pair Angles
3. H Coplanar points
4. F Congruent (Symbol)
5. A Skew lines
6. D Complementary Angles
7. B Segment bisector
8. E Angle bisector

	Name:	Definition:	Example:	Picture:
<b>Congruent Angles</b>	Vertical Angles:	each of the pairs of opposite angles made by intersecting lines	$\angle 1 \& \angle 4$ $\angle 3 \& \angle 2$ $\angle 5 \& \angle 8$ $\angle 7 \& \angle 6$	
	Corresponding Angles:	the angles that occupy the same relative position at each intersection where a straight line crosses two others. <i>if the two lines are parallel, the corresponding angles are equal.</i>	$\angle 2 \& \angle 6$ $\angle 4 \& \angle 8$ $\angle 1 \& \angle 5$ $\angle 3 \& \angle 7$	
	Alternate Interior Angles:	Two angles that lie between parallel lines on opposite sides of the transversal (but not a linear pair)	$\angle 3 \& \angle 6$ $\angle 4 \& \angle 5$	
	Alternate Exterior Angles:	Two angles that lie outside parallel lines on opposite sides of the transversal	$\angle 1 \& \angle 8$ $\angle 2 \& \angle 7$	
<b>Supplementary Angles</b>	Linear Pair:	A pair of adjacent, supplementary angles. <i>Adjacent</i> means next to each other. <i>Supplementary</i> means that the measures of two angles add up to equal $180^\circ$ .	$\angle 1 \& \angle 2$ $\angle 3 \& \angle 4$ $\angle 5 \& \angle 6$ $\angle 7 \& \angle 8$	
	Consecutive Interior Angles:	The pair of angles on one side of the transversal but inside the two lines <i>when the two lines being crossed are parallel, then they add up to be <math>180^\circ</math></i>	$\angle 4 \& \angle 6$ $\angle 3 \& \angle 5$	
	Consecutive Exterior Angles:	Pairs of angles on one side of the transversal but outside the two lines. <i>When the two lines being crossed are <math>\parallel</math>, then they add up to be <math>180^\circ</math>.</i>	$\angle 2, \& \angle 8$ $\angle 1 \& \angle 7$	



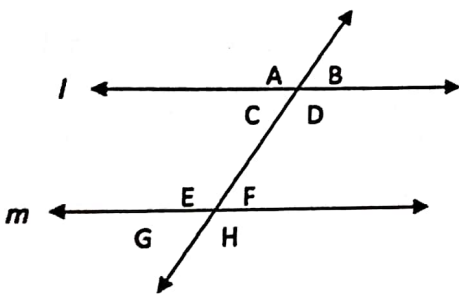
# Homework 5.1: Parallel Lines and Transversals

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

Directions: Name each of the following types of angles. Then, state whether they are congruent or supplementary.

	<p>Name: Corresponding Angles</p> <p>(Congruent) or Supplementary</p>	<p>2)</p>	<p>Name: Alternate Exterior Angles</p> <p>(Congruent) or Supplementary</p>
<p>3)</p>	<p>Name: Corresponding Angles</p> <p>(Congruent) or Supplementary</p>	<p>4)</p>	<p>Name: Consecutive Interior Angles</p> <p>Congruent or (Supplementary)</p>

Directions: Find the value of  $x$  in each question given that lines  $l$  and  $m$  are parallel. Check your answers by finding the measure of each angle.



5.  $m\angle C = 3x - 10$ ;  
 $m\angle F = x + 70$

$$3x - 10 = x + 70$$

$$2x = 80$$

$$x = 40$$

6.  $m\angle D = x + 27$ ;  
 $m\angle F = 2x - 39$

$$x + 27 + 2x - 39 = 180$$

$$3x - 12 = 180$$

$$3x = 192$$

$$x = 64$$

7.  $m\angle B = 2(x + 40)$ ;  
 $m\angle G = 5x + 44$

$$2(x + 40) = 5x + 44$$

$$2x + 80 = 5x + 44$$

$$-3x = -36$$

$$x = 12$$

$$x = 40$$

$$m\angle C = 110$$

$$m\angle F = 110$$

$$x = 64$$

$$m\angle D = 91$$

$$m\angle F = 89$$

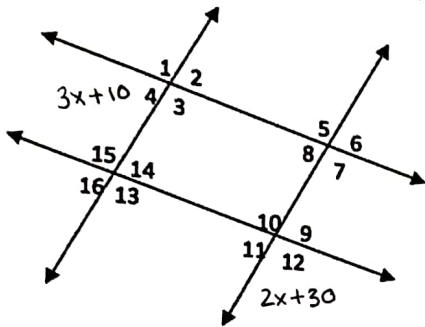
$$x = 12$$

$$m\angle B = 104$$

$$m\angle G = 104$$

Directions: Solve for the following. Show all work in the space provided.

8. Given that  $m\angle 4 = 3x + 10$  and  $m\angle 12 = 2x + 30$ , find the value of  $x$ ,  $m\angle 4$ ,  $m\angle 10$ .



$$3x + 10 + 2x + 30 = 180$$

$$5x + 40 = 180$$

$$-40 \quad -40$$

$$5x = 140$$

$$x = 28$$

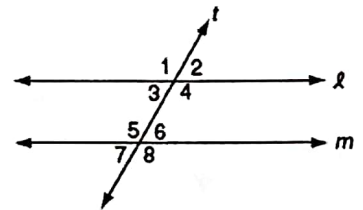
$$x = 28$$

$$m\angle 4 = 94$$

$$m\angle 10 = 86$$

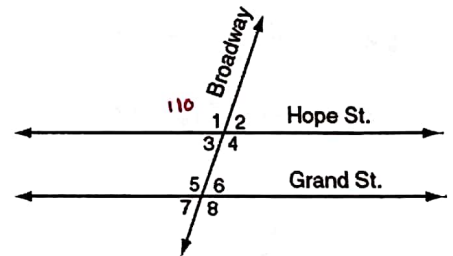
9. In the accompanying diagram, line  $l$  is parallel to line  $m$ , and line  $t$  is a transversal. Which must be a true statement?

- (1)  $m\angle 1 + m\angle 4 = 180$       (3)  $m\angle 3 + m\angle 6 = 180$   
 (2)  $m\angle 1 + m\angle 8 = 180$       (4)  $m\angle 2 + m\angle 5 = 180$



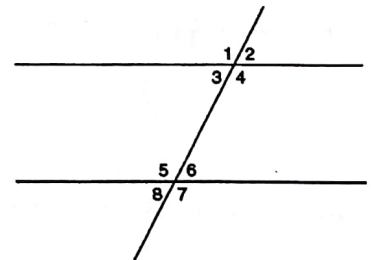
10. The accompanying diagram shows two parallel roads, Hope Street and Grand Street, crossed by a transversal road, Broadway. If  $m\angle 1 = 110$ , what is the measure of  $m\angle 7$ ?

- (1)  $40^\circ$       (3)  $110^\circ$   
 (2)  $70^\circ$       (4)  $180^\circ$

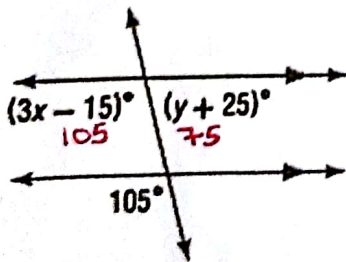


11. In the accompanying figure, what is one pair of alternate interior angles?

- (1)  $\angle 1$  and  $\angle 2$       (3)  $\angle 4$  and  $\angle 6$   
 (2)  $\angle 4$  and  $\angle 5$       (4)  $\angle 6$  and  $\angle 8$



12. Find the value of  $x$  and  $y$ .



$$x = 40$$

$$y = 50$$

$$3x - 15 = 105$$

$$3x = 120$$

$$x = 40$$

$$(y + 25) + 105 = 180$$

$$y + 130 = 180$$

$$y = 50$$