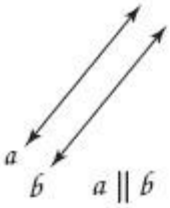
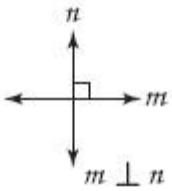
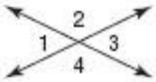
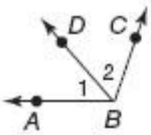
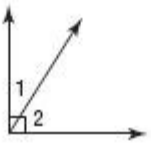
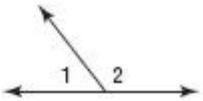
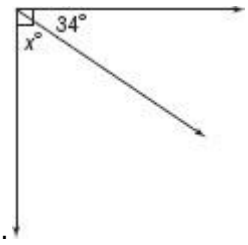
11-1 Angle and Line Relationships

Line and Angle Relationships					
Parallel Lines	Perpendicular Lines	Vertical Angles	Adjacent Angles	Complementary Angles	Supplementary Angles
		 ∠1 ≅ ∠3 ∠2 ≅ ∠4	 m∠ABC = m∠1 + m∠2	 m∠1 + m∠2 = 90°	 m∠1 + m∠2 = 180°

A line that intersects two or more other lines is called a transversal.

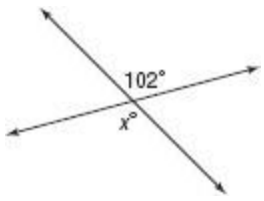
Example: In the figure at the right, classify the relationship between the pairs of angles shown. Then find the value of *x*.

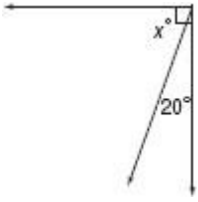
The angles are complementary. The sum of their measures is 90°.

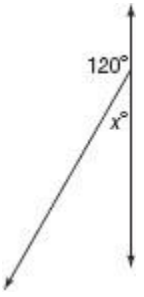


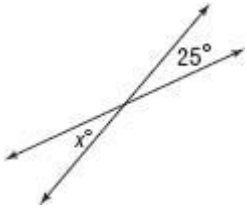
So, $m\angle x$ is 56°

Try these: Classify the pairs of angles shown. Then find the value of *x* in each figure.

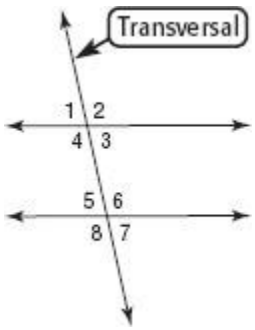
1. 

2. 

3. 

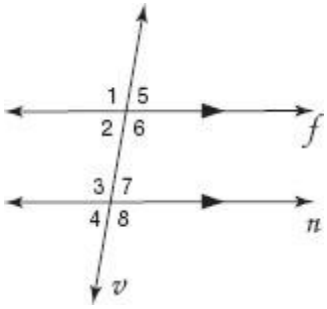
4. 

Names of Special Angles

Alternate interior angles are on opposite sides of the transversal and inside the parallel lines. ∠3 and ∠5, ∠4 and ∠6		
Alternate exterior angles are on opposite sides of the transversal and outside the parallel lines.	∠1 and ∠7, ∠2 and ∠8	
Corresponding angles are in the same position on the parallel lines in relation to the transversal.	∠1 and ∠5, ∠2 and ∠6, ∠3 and ∠7, ∠4 and ∠8	

When a transversal intersects two parallel lines, pairs of alternate exterior angles, alternate interior angles, and corresponding angles are congruent.

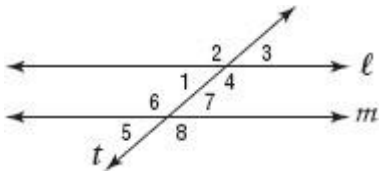
Example In the figure, *f* ∥ *n* and *v* is a transversal. If *m*∠3 = 100°, find *m*∠1 and *m*∠6.



Since ∠1 and ∠3 are corresponding angles, they are congruent. So, *m*∠1 = 100°. Since ∠3 and ∠6 are alternate interior angles, they are congruent. So, *m*∠6 = 100°.

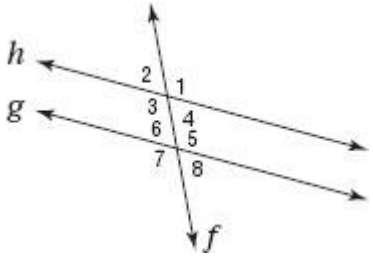
Try This:

In the figure on the right, *l* ∥ *m* and *t* is a transversal. If *m*∠1 = 61.2° and the *m*∠6 = 118.8°, find the measure of each angle.



1) ∠7 2) ∠3 3) ∠4 4) ∠8 5) ∠5 6) ∠2

In the figure on the right, *g* ∥ *h* and *f* is a transversal. If *m*∠1 = 125° and the *m*∠6 = 55°, find the measure of each angle.



7) ∠2 8) ∠4 9) ∠5 10) ∠3 11) ∠8 12) ∠7