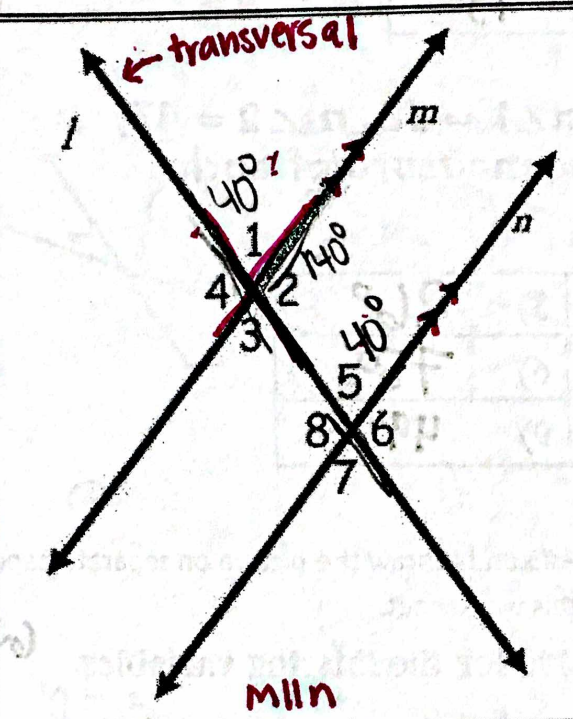


# When Two Parallel Lines Are Cut By a Transversal, What Angle Pair Relationships Exist?

Unit 2  
Part 2  
Copies

**Corresponding Angles**  
 $\angle 1$  and  $\angle 5$        $\angle 2$  and  $\angle 6$   
 $\angle 7$  and  $\angle 3$        $\angle 4$  and  $\angle 8$   
 Corresponding angles are congruent  
 $\cong$

**Alternate Interior**  
 $\angle 3$  and  $\angle 5$   
 $\angle 2$  and  $\angle 8$   
 Alternate interior angles are  $\cong$



**Alternate Exterior**  
 $\angle 4$  and  $\angle 6$   
 $\angle 1$  and  $\angle 7$   
 Alternate exterior angles are  $\cong$

**Same Side Interior or Consecutive Interior**  
 $\angle 3$  and  $\angle 8$   
 $\angle 2$  and  $\angle 5$   
 Same side interior or consecutive interior angles are Supplementary  
 (add to  $180^\circ$ )

**Same Side Exterior or Consecutive Exterior**  
 $\angle 1$  and  $\angle 6$   
 $\angle 4$  and  $\angle 7$   
 Same side exterior or consecutive exterior angles are Supplementary

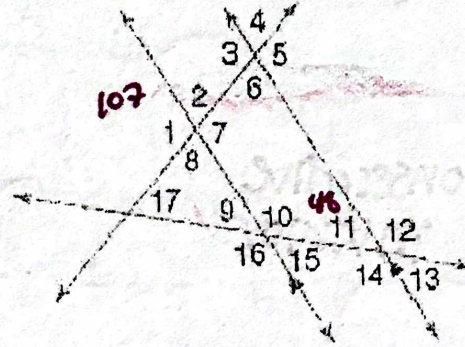
~~**Vertical Pair**~~  $\angle 5$  and  $\angle 7$   
 $\angle 1$  and  $\angle 3$   
 Vertical angles are congruent  
 $\cong$

**Linear Pair**  $\angle 4$  and  $\angle 3$   
 $\angle 1$  and  $\angle 2$        $\angle 1$  and  $\angle 4$   
 Linear pair of angles are supplementary



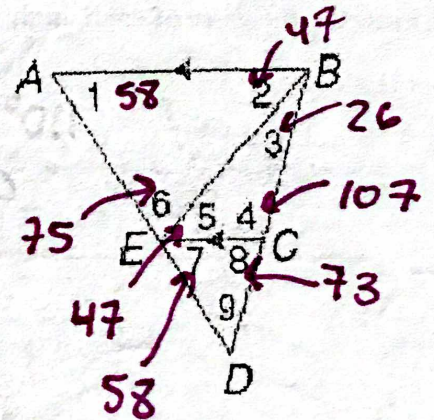
In the figure at the right,  $p \parallel q$ ,  $m\angle 1 = 107$ , and  $m\angle 11 = 48$ . Find the measure of each angle.

1) $107^\circ$	2) $73$	3) $107^\circ$
4) $73$	5) $107^\circ$	6) $73$
7) $107^\circ$	8) $73$	9) $48$
10) $132$	11) $48^\circ$	12) $132$
13) $48$	14) $132$	15) $48$



In the figure,  $\overline{AB} \parallel \overline{EC}$ ,  $m\angle 1 = 58$ ,  $m\angle 2 = 47$ , and  $m\angle 3 = 26$ . Find the measure of each angle.

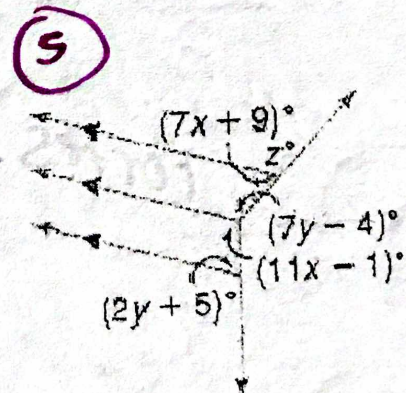
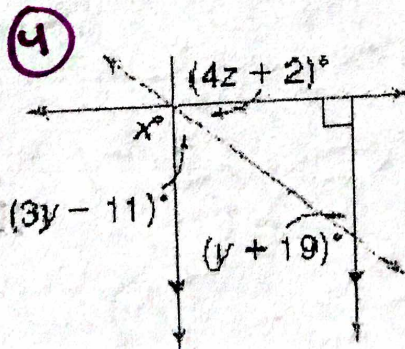
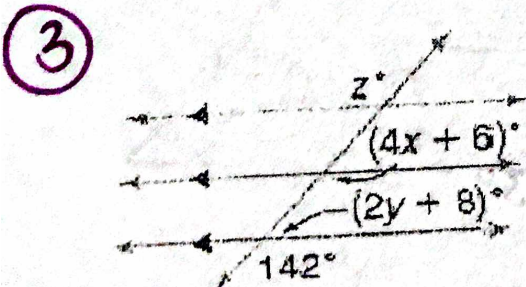
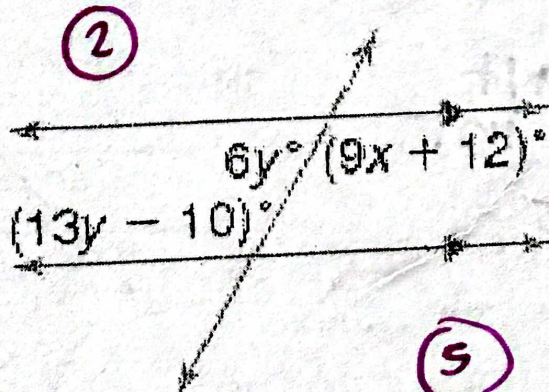
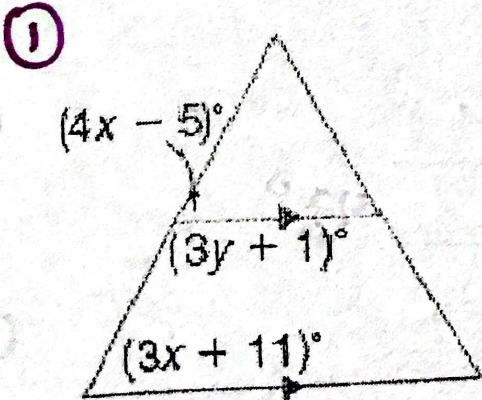
1) $58^\circ$	2) $47^\circ$	3) $26$
4) $107$	5) $47^\circ$	6) $75$
7) $58^\circ$	8) $73$	9) $49$



Number each of the following problems #1 - #5 and redraw the picture on separate paper. Then show all work to find the missing variables. Staple your paper to this worksheet.

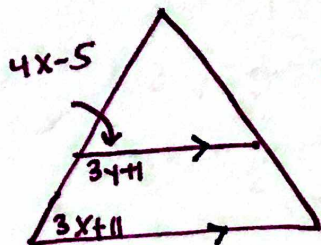
Redraw each of the following, solve for the missing variables.

answers on next page





①



$$4x - 5 = 3x + 11 \quad (\text{corresponding } \angle\text{'s})$$

$$\boxed{x = 16}$$

$$3(16) + 11 = 59^\circ$$

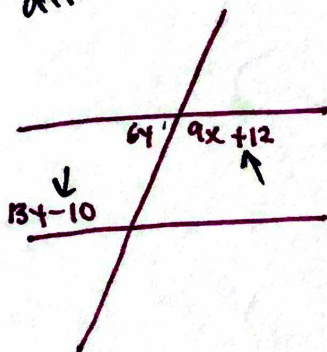
$$\text{So } 3y + 11 = 121^\circ$$

$$3y = 110$$

$$\boxed{y = 40}$$

②

alt. interiors



$$6y + 13y - 10 = 180$$

$$19y = 190$$

$$\boxed{y = 10}$$

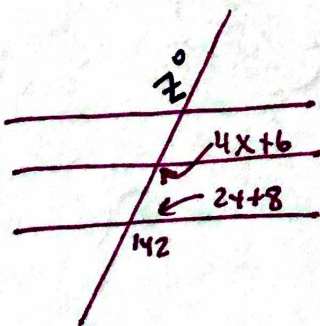
$$6y = 6(10) = 60^\circ$$

$$9x + 12 = 120^\circ$$

$$9x = 108$$

$$\boxed{x = 12}$$

③



$$\text{corresponding } \angle\text{'s}$$

$$4x + 6 = 142^\circ$$

$$4x = 136$$

$$\boxed{x = 34}$$

$$\boxed{z = 142}$$

$z$  and  $142^\circ$  are alt. exteriors

$$180 - 142 = 38^\circ$$

so

$$2y + 8 = 38^\circ$$

$$2y = 30$$

$$\boxed{y = 15}$$

④

$$\boxed{x = 90}$$

$$3y - 11 = y + 19 \rightarrow$$

$$2y = 30$$

$$\boxed{y = 15}$$

$$3(15) - 11 = 34^\circ$$

$$90 - 34^\circ = 56^\circ \rightarrow$$

$$4z + 2 = 56^\circ$$

$$4z = 54$$

$$\boxed{z = 13.5}$$



$$\textcircled{5} \quad 11x - 1 + 2y + 5 = 180^\circ$$

$$11x + 2y = 176$$

$$y = -\frac{11}{2}x + 88$$

$$7x + 9 + 7y - 4 = 180$$

$$7x + 7y + 5 = 180$$

$$7x + 7y = 175$$

$$7y = -7x + 175$$

$$y = -x + \frac{175}{7}$$

$$-\frac{11}{2}x + 88 = -x + \frac{175}{7}$$

$$-\frac{11}{2}x + 88 = -x + 25$$

$$63 = 4.5x$$

$$\boxed{14 = x} \rightarrow$$

$$11x - 1 + 2y + 5 = 180$$

$$11(14) - 1 + 2y + 5 = 180$$

$$158 + 2y = 180$$

$$\leftarrow \boxed{y = 11}$$

$$7x + 9 + z = 180^\circ$$

$$7(14) + 9 + z = 180^\circ$$

$$z + 107 = 180$$

$$\boxed{z = 73^\circ}$$