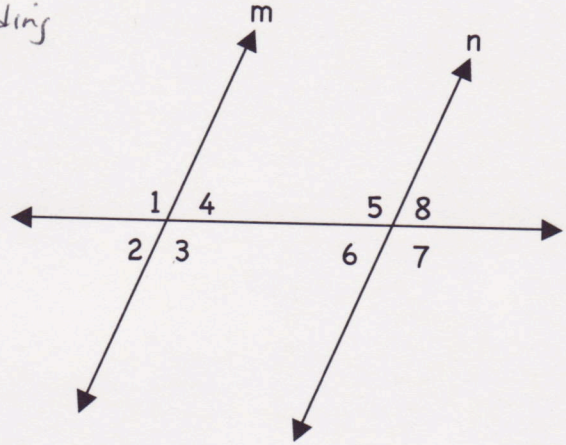


## Finding Angle Measures with Indirect Relationships

Using the diagram at the right, answer the following questions. Note:  $m \parallel n$ . **Explain** how you determined your answer (relationship?).



1. If  $m \angle 1 = 100^\circ$ , what is  $m \angle 8$ ?

$80^\circ$ ,  $m \angle 1$  is 100,  $m \angle 5 = 100$  - corresponding  
 $m \angle 5 + m \angle 8$  are supplementary

2. If  $m \angle 4 = 68^\circ$ , what is  $m \angle 6$ ?

$68^\circ$  - alternate interior angles

3. If  $m \angle 3 = 102^\circ$ , what is  $m \angle 6$ ?

$78^\circ$   $m \angle 3 + m \angle 6$  are  
 supplementary

4. If  $m \angle 7 = 98^\circ$ , what is  $m \angle 1$ ?

$98^\circ$  - alternate exterior angles

5. If  $m \angle 2 = 65^\circ$ , what is  $m \angle 7$ ?

$115^\circ$ ,  $m \angle 2 \cong m \angle 6$  - corresponding angles  
 $m \angle 6 + m \angle 7 = 180^\circ$

6. If  $m \angle 5 = 125^\circ$ , what is  $m \angle 2$ ?

$55^\circ$   $m \angle 5 \cong m \angle 1 = 125$  corresponding angles  
 $m \angle 1 + m \angle 2 = 180$  supplementary

7. If  $m \angle 6 = 53^\circ$ , what is  $m \angle 5$ ?

$127^\circ$   $53 + 127 = 180$  supplementary angles

8. If  $m \angle 8 = 54^\circ$ , what is  $m \angle 4$ ?

$54^\circ$  corresponding angles

Using the diagram at the right, answer the following questions. Note:  $r \parallel s$

9. Solve for  $r$  if  $m \angle 1$  is  $5r - 25$   
and  $m \angle 5$  is  $75^\circ$ .

$$\begin{array}{r} 5r - 25 = 75 \\ +25 \quad +25 \\ \hline 5r = 100 \\ \underline{\quad} \\ r = 20 \end{array}$$

10. Solve for  $x$  if  $m \angle 3$  is  $\frac{1}{2}x + 40$   
and  $m \angle 6$  is  $120^\circ$ .

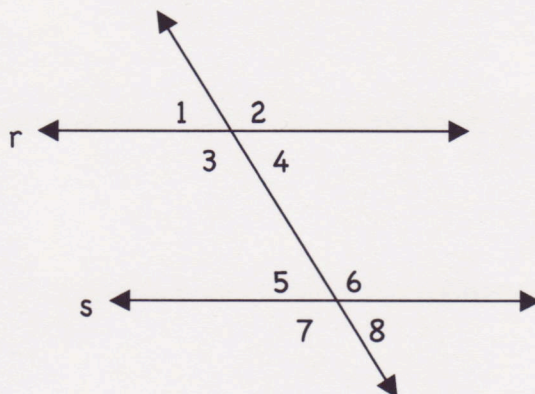
$$\begin{array}{r} \frac{1}{2}x + 40 = 120 \\ -40 \quad -40 \\ \hline \frac{1}{2}x = 80 \quad (2) \\ \underline{\quad} \\ x = 160 \end{array}$$

11. Solve for  $s$  if  $m \angle 2$  is  $3s + 30$   
and  $m \angle 8$  is  $60^\circ$ .

$$\begin{array}{r} 3s + 30 = 120 \\ -30 \quad -30 \\ \hline 3s = 90 \\ \underline{\quad} \\ s = 30 \end{array}$$

12. Solve for  $z$  if  $m \angle 7$  is  $2z - 12$   
and  $m \angle 4$  is  $80^\circ$ .

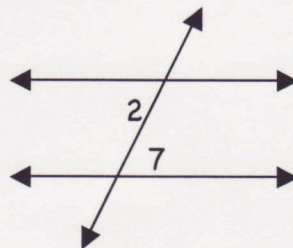
$$\begin{array}{r} 2z - 12 = 100 \\ +12 \quad +12 \\ \hline 2z = 112 \\ \underline{\quad} \\ z = 56 \end{array}$$



Solve each problem using the diagram to the right of the problem. Each diagram has a pair of parallel lines cut by a transversal.

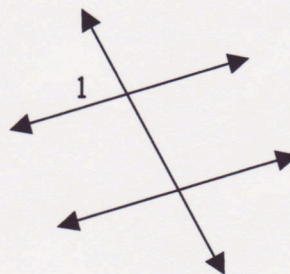
13. If  $m \angle 2 = 70^\circ$ , what is  $m \angle 7$ ?  
How would you determine that?

$70^\circ$  alternate interior angles



14. If  $m \angle 1 = 3x + 12$  and its adjacent angle measure is  $96^\circ$ , what is the value of  $x$ ?

$$\begin{array}{r} 3x + 12 = 84 \\ -12 \quad -12 \\ \hline 3x = 72 \\ \underline{\quad} \\ x = 24 \end{array}$$



15. If  $m \angle 6 = 2x - 4$  and its corresponding angle measure is  $76^\circ$ , what is the value of  $x$ ?

$$\begin{array}{r} 2x - 4 = 76 \\ +4 \quad +4 \\ \hline 2x = 80 \\ \underline{\quad} \\ x = 40 \end{array}$$

