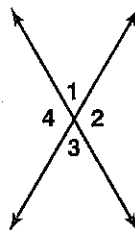


# Reteaching 8-1

## Pairs of Angles

- *Vertical angles* are pairs of opposite angles formed by two intersecting lines. They are congruent.

*Example 1:*  $\angle 1$  and  $\angle 3$ ,  $\angle 4$  and  $\angle 2$



- *Adjacent angles* have a common vertex and a common side, but no common interior points.

*Example 2:*  $\angle 1$  and  $\angle 2$ ,  $\angle 1$  and  $\angle 4$

- Two *supplementary angles* form a  $180^\circ$  angle.

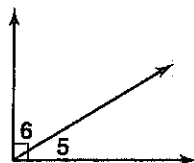
*Example 3:*  $\angle 1$  and  $\angle 4$  are supplementary angles.  
 $\angle 3$  is also a supplement of  $\angle 4$ .

If you know the measure of one supplementary angle, you can find the measure of the other. →

If  $m\angle 4$  is  $120^\circ$ ,  
 then  $m\angle 1$  is  $180^\circ - 120^\circ$ , or  $60^\circ$ .

- Two *complementary angles* form a  $90^\circ$  angle.

*Example 4:*  $\angle 5$  and  $\angle 6$  are complementary angles.  
 $\angle 6$  is a complement of  $\angle 5$ .

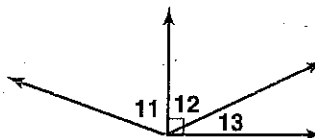
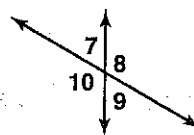


If you know the measure of one complementary angle, you can find the measure of the other. →

If  $m\angle 5$  is  $30^\circ$ ,  
 then  $m\angle 6$  is  $90^\circ - 30^\circ$ , or  $60^\circ$ .

Use the diagrams at the right for Exercises 1–6.

1. Vertical angles  $\angle 7$  and \_\_\_\_\_
2. Adjacent angles  $\angle 10$  and \_\_\_\_\_
3. Supplementary angles  $\angle 8$  and \_\_\_\_\_
4. Complementary angles  $\angle 12$  and \_\_\_\_\_
5. Vertical angles  $\angle 8$  and \_\_\_\_\_
6. Supplementary angles  $\angle 7$  and \_\_\_\_\_



Find the measure of the supplement of each angle.

7.  $38^\circ$                       8.  $65^\circ$                       9.  $120^\circ$                       10.  $152^\circ$

\_\_\_\_\_

Find the measure of the complement of each angle.

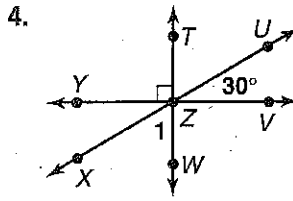
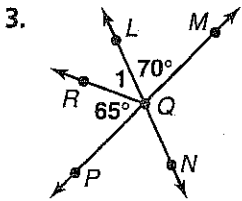
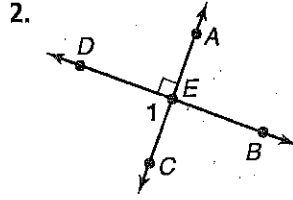
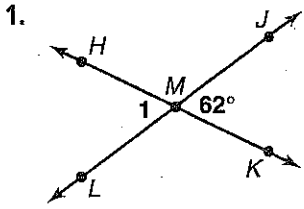
11.  $25^\circ$                       12.  $18^\circ$                       13.  $40^\circ$                       14.  $64^\circ$

\_\_\_\_\_

# Practice 8-1

## Pairs of Angles

Name a pair of vertical angles and a pair of adjacent angles in each figure. Find  $m\angle 1$ .

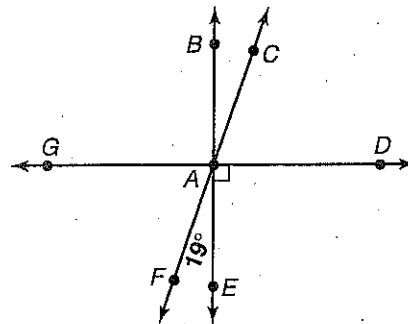


Find the measure of the supplement and the complement of each angle.

- |               |               |                 |              |
|---------------|---------------|-----------------|--------------|
| 5. $10^\circ$ | 6. $38^\circ$ | 7. $42.5^\circ$ | 8. $n^\circ$ |
| _____         | _____         | _____           | _____        |

Use the diagram at the right for Exercises 9–14. Decide whether each statement below is true or false.

9.  $\angle GAF$  and  $\angle BAC$  are vertical angles. \_\_\_\_\_
10.  $\angle EAF$  and  $\angle EAD$  are adjacent angles. \_\_\_\_\_
11.  $\angle CAD$  is a supplement of  $\angle DAF$ . \_\_\_\_\_
12.  $\angle CAD$  is a complement of  $\angle EAF$ . \_\_\_\_\_
13.  $m\angle GAC = 90^\circ$ . \_\_\_\_\_
14.  $m\angle DAF = 109^\circ$ . \_\_\_\_\_



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# EXERCISES

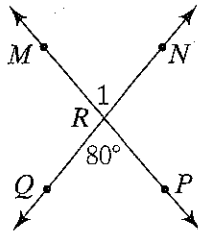
? For more practice, see *Extra Practice*.

## A Practice by Example

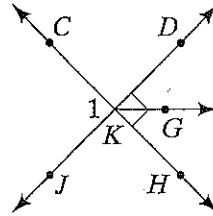
Example 1  
(page 408)

Name a pair of vertical angles and a pair of adjacent angles in each figure. Find  $m\angle 1$ .

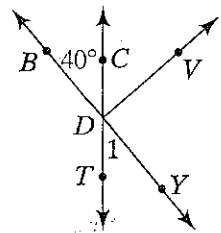
1.



2.



3.



Example 2  
(page 409)

Find the measure of the supplement of each angle. Exercise 4 has been started for you.

4.  $74^\circ$   
 $x^\circ + 74^\circ = 180^\circ$

5.  $24^\circ$

6.  $145^\circ$

7.  $39^\circ$

8.  $116^\circ$

9.  $158^\circ$

Example 3  
(page 409)

Find the measure of the complement of each angle. Exercise 10 has been started for you.

10.  $39^\circ$   
 $x^\circ + 39^\circ = 90^\circ$

11.  $87^\circ$

12.  $43^\circ$

13.  $21^\circ$

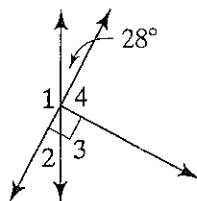
14.  $5^\circ$

15.  $56^\circ$

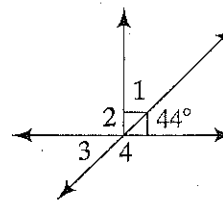
Example 4  
(page 409)

Find the measure of each numbered angle.

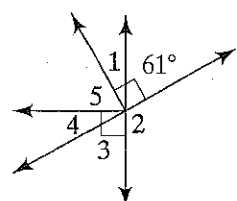
16.



17.



18.



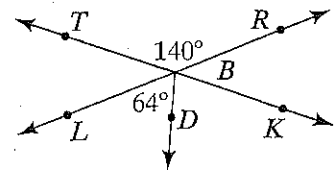
## B Apply Your Skills

Use the diagram at the right for Exercises 19–22.

19.  $\angle LBD$  and  $\angle TBL$  are ? angles.

20.  $\angle RBT$  and  $\angle ?$  are vertical angles.

21.  $m\angle KBL = \blacksquare^\circ$       22.  $m\angle DBK = \blacksquare^\circ$

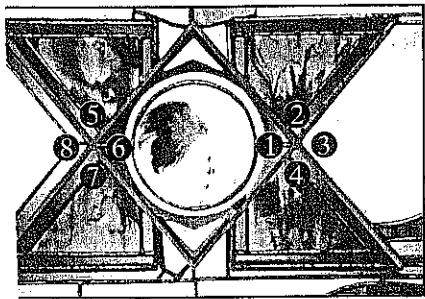


23. a. ~~Open-Ended~~ Draw a pair of adjacent supplementary angles.

b. ~~Use a protractor. Draw a pair of supplementary angles that are not adjacent. Label each angle measure.~~

24. a. **Algebra** Write a formula to find the complement of an angle  $x^\circ$ .

b. ~~Write a formula to find the supplement of an angle  $y^\circ$ .~~



**Windows** Use the stained glass window for Exercises 25–28.

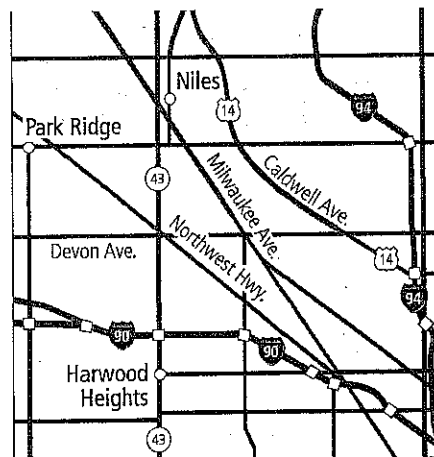
25. Are  $\angle 1$  and  $\angle 7$  adjacent angles? Explain why or why not.
26. Are  $\angle 2$  and  $\angle 3$  vertical angles? Explain why or why not.
27. Name a pair of adjacent angles. Name a pair of vertical angles.
28. Suppose  $m\angle 1 = m\angle 6$ . Are  $\angle 1$  and  $\angle 5$  supplementary angles? Explain why or why not.

Find the measure of the complement and the supplement of each angle. If there is no complement, write *no complement*.

- |                |                   |                  |
|----------------|-------------------|------------------|
| 29. $32^\circ$ | 30. $42.3^\circ$  | 31. $85.9^\circ$ |
| 32. $91^\circ$ | 33. $139.5^\circ$ | 34. $179^\circ$  |

**Maps** A map of the Chicago area is shown at the right.

- a. Find the measure of the acute angle formed by Route 43 and Northwest Highway.
- b. If you travel from Harwood Heights on Route 43 and turn right onto Northwest Highway, how many degrees do you turn?

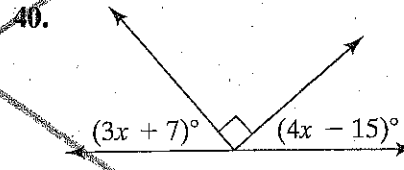
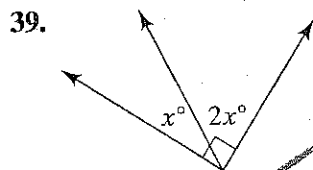
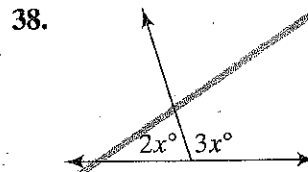
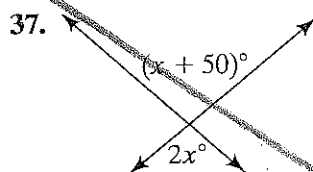


36. a. **Writing in Math** Can two supplementary angles have the same measure? Explain.
- b. Can two complementary angles have the same measure? Explain.

Route 43 is perpendicular to Devon Avenue. Northwest Highway and Devon Avenue intersect at  $40^\circ$  angles.

**Challenge**

**Algebra** Write an equation for each pair of angles. Then solve for  $x$ .



41. **Stretch Your Thinking** Kira, Irene, and Tim bought 24 CDs at a recent sale. Kira bought 2 fewer than twice the number of CDs that Irene bought. Irene bought 2 more than half as many as Tim bought. How many CDs did each person buy?