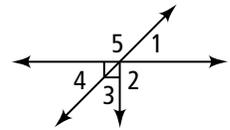


# 7.5 Practice

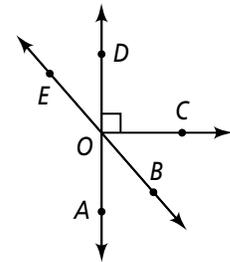
## Exploring Angle Pairs

Use the diagram at the right. Is each statement true? Explain.



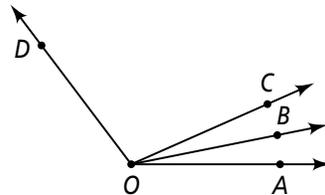
- $\angle 2$  and  $\angle 5$  are adjacent angles.  
**False; the angles are not next to each other.**
- $\angle 1$  and  $\angle 4$  are vertical angles.  
**True; they are on opposite sides of a vertex formed by two lines.**
- $\angle 4$  and  $\angle 5$  are complementary. **False; the measures sum to 180, not 90.**

Name an angle or angles in the diagram described by each of the following.



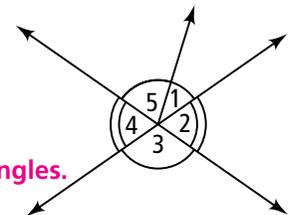
- complementary to  $\angle BOC$   **$\angle BOA$**
- supplementary to  $\angle DOB$   **$\angle BOA$  and  $\angle DOE$**
- adjacent and supplementary to  $\angle AOC$   **$\angle DOC$**

Use the diagram below for Exercises 7 and 8. Solve for  $x$ . Find the angle measures.



- $m\angle AOB = 4x - 1$ ;  $m\angle BOC = 2x + 15$ ;  $m\angle AOC = 8x + 8$   
 **$3$ ;  $m\angle AOB = 11$ ;  $m\angle BOC = 21$ ;  $m\angle AOC = 32$**
- $m\angle COD = 8x + 13$ ;  $m\angle BOC = 3x - 10$ ;  $m\angle BOD = 12x - 6$   
 **$9$ ;  $m\angle COD = 85$ ;  $m\angle BOC = 17$ ;  $m\angle BOD = 102$**
- $\angle ABC$  and  $\angle EBF$  are a pair of vertical angles;  $m\angle ABC = 3x + 8$  and  $m\angle EBF = 2x + 48$ . What are  $m\angle ABC$  and  $m\angle EBF$ ?  
 **$m\angle ABC = m\angle EBF = 128$**
- $\angle JKL$  and  $\angle MNP$  are complementary;  $m\angle JKL = 2x - 3$  and  $m\angle MNP = 5x + 2$ . What are  $m\angle JKL$  and  $m\angle MNP$ ?  
 **$m\angle JKL = 23$ ;  $m\angle MNP = 67$**

For Exercises 11–14, can you make each conclusion from the information in the diagram? Explain.

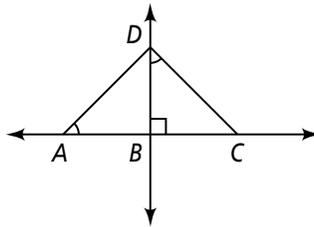


- $\angle 3 \cong \angle 4$  **No; adjacent angles are not always congruent.**
- $\angle 2 \cong \angle 4$  **Yes; they are vertical angles.**
- $m\angle 1 + m\angle 5 = m\angle 3$  **Yes; the arcs indicate that the sum of  $\angle 1$  and  $\angle 5$  equals  $\angle 3$ .**
- $m\angle 3 = 90$  **No; a right angle mark is needed.**
- $\overline{KM}$  bisects  $\angle JKL$ . If  $m\angle JKM = 86$ , what is  $m\angle JKL$ ? **172**
- $\overrightarrow{SV}$  bisects  $\angle RST$ . If  $m\angle RST = 62$ , what is  $m\angle RSV$ ? **31**

$\overrightarrow{QS}$  bisects  $\angle PQR$ . Solve for  $x$  and find  $m\angle PQR$ .

17.  $m\angle PQS = 3x$ ;  $m\angle SQR = 5x - 20$  **10; 60**
18.  $m\angle PQS = 2x + 1$ ;  $m\angle RQS = 4x - 15$  **8; 34**
19.  $m\angle PQR = 3x - 12$ ;  $m\angle PQS = 30$  **24; 60**
20.  $m\angle PQS = 2x + 10$ ;  $m\angle SQR = 5x - 17$  **9; 56**

For Exercises 21–24, can you make each conclusion from the information in the diagram below? Explain.



21.  $\angle DAB$  and  $\angle CDB$  are congruent. **Yes; the angles are marked as congruent.**
22.  $\angle ADB$  and  $\angle CDB$  are complementary. **Yes;  $\angle DAB$  and  $\angle ADB$  are complementary and  $\angle DAB$  is congruent to  $\angle CDB$ .**
23.  $\angle ADB$  and  $\angle CDB$  are congruent. **No; it is impossible to tell if they are congruent unless a measure of 45 is given.**
24.  $\angle ADB$  and  $\angle BCD$  are congruent. **Yes; their complements are congruent.**
25. **Algebra**  $\angle MLN$  and  $\angle JLK$  are complementary,  $m\angle MLN = 7x - 1$ , and  $m\angle JLK = 4x + 3$ .
  - a. Solve for  $x$ . **8**
  - b. Find  $m\angle MLN$  and  $m\angle JKL$ . **55; 35**
  - c. Show how you can check your answer.  **$55 + 35 = 90$**
26. **Reasoning** Describe all the situations in which the following statements are true.
  - a. Two vertical angles are also complementary. **The measure of each angle must be 45.**
  - b. A linear pair is also supplementary. **This is always true.**
  - c. Two supplementary angles are also a linear pair. **The angles are also adjacent.**
  - d. Two vertical angles are also a linear pair. **This is never true.**