1.6 Describing Pairs of Angles
For use with Exploration 1.6

Essential Question How can you describe angle pair relationships and use these descriptions to find angle measures?
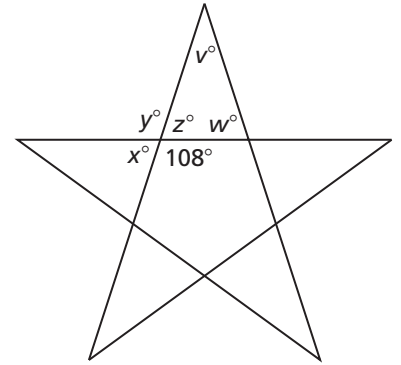
1 EXPLORATION: Finding Angle Measures

Work with a partner. The five-pointed star has a regular pentagon at its center.

a. What do you notice about the following angle pairs?

$x°$ and $y°$

$y°$ and $z°$

$x°$ and $z°$

b. Find the values of the indicated variables. Do not use a protractor to measure the angles.

$x =$

$y =$

$z =$

$w =$

$v =$

Explain how you obtained each answer.

1.6 **Describing Pairs of Angles** (continued)

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2 **EXPLORATION:** Finding Angle Measures

Work with a partner. A square is divided by its diagonals into four triangles.

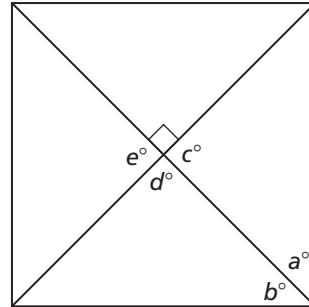**a.** What do you notice about the following angle pairs?

$a°$ and $b°$

$c°$ and $d°$

$c°$ and $e°$

b. Find the values of the indicated variables. Do not use a protractor to measure the angles.

$c =$

$d =$

$e =$

Explain how you obtained each answer.

Communicate Your Answer

3. How can you describe angle pair relationships and use these descriptions to find angle measures?

4. What do you notice about the angle measures of complementary angles, supplementary angles, and vertical angles?

1.6 Notetaking with Vocabulary
For use after Lesson 1.6

In your own words, write the meaning of each vocabulary term.
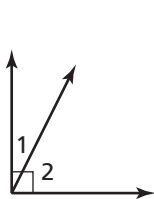
complementary angles

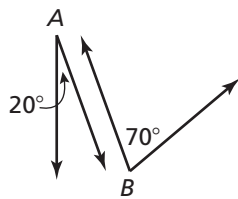supplementary angles

adjacent angles

linear pair

vertical angles

Core Concepts
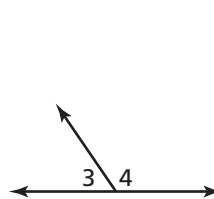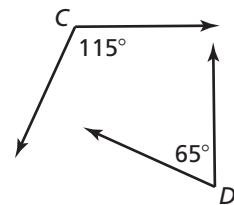
Complementary and Supplementary Angles

∠1 and ∠2   ∠*A* and ∠*B*

complementary angles

Two positive angles whose measures have
a sum of 90°. Each angle is the *complement*
of the other.

∠3 and ∠4   ∠*C* and ∠*D*

supplementary angles

Two positive angles whose measures have a
sum of 180°. Each angle is the *supplement*
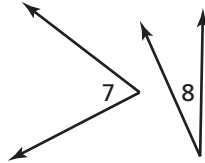of the other.

Notes:

1.6 **Notetaking with Vocabulary** (continued)

Adjacent Angles

Complementary angles and supplementary angles can be *adjacent angles* or *nonadjacent angles*. **Adjacent angles** are two angles that share a common vertex and side, but have no common interior points.

common side

5
6

common vertex
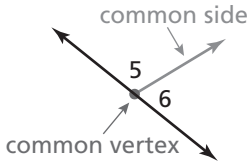
∠5 and ∠6 are adjacent angles
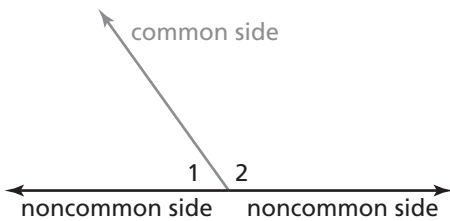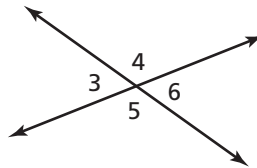
7 8

∠7 and ∠8 are nonadjacent angles.

Notes:

Linear Pairs and Vertical Angles

Two adjacent angles are a **linear pair** when their noncommon sides are opposite rays. The angles in a linear pair are supplementary angles.

common side

1 2
noncommon side   noncommon side

∠1 and ∠2 are a linear pair.

Two angles are **vertical angles** when their sides form two pairs of opposite rays.

3 4
5 6

∠3 and ∠6 are vertical angles.
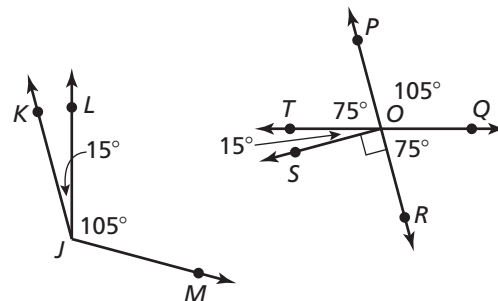
∠4 and ∠5 are vertical angles.

Notes:

1.6 **Notetaking with Vocabulary** (continued)

Extra Practice

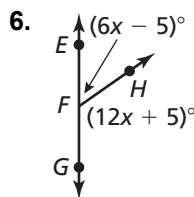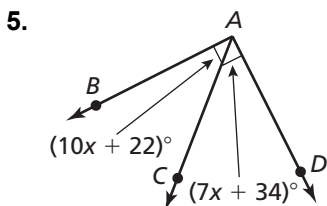**In Exercises 1 and 2, use the figure.**

1. Name the pair(s) of adjacent complementary angles.

2. Name the pair(s) of nonadjacent supplementary angles.

In Exercises 3 and 4, find the angle measure.

3. $\angle A$ is a complement of $\angle B$ and $m\angle A = 36°$. Find $m\angle B$.

4. $\angle C$ is a supplement of $\angle D$ and $m\angle D = 117°$. Find $m\angle C$.

In Exercises 5 and 6, find the measure of each angle.

5.

6.

In Exercises 7–9, use the figure.

7. Identify the linear pair(s) that include $\angle 1$.

8. Identify the vertical angles.

9. Are $\angle 6$ and $\angle 7$ a linear pair? Explain.