

Grade 8 Mathematics

Geometry: Lesson 7

Read aloud to the students the material that is printed in **boldface type** inside the boxes. Information in regular type inside the boxes and all information outside the boxes should **not** be read to students. Possible student responses are included in parentheses after the questions.

NOTE: The directions read to students may depend on the available materials. Read only those parts of the lesson that apply to the materials you are using.

Any directions that ask you to do something, such as to turn to a page or to hand out materials to students, will have an arrow symbol (\downarrow) by them.

Purpose of Lesson 7:

- In this lesson, the tutor and the students will
 - ✓ identify complementary, supplementary, and vertical angles; and
 - ✓ find the measure of unknown angles.

Equipment/Materials Needed:

- Copies of Student Sheet 75
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 7:

- Run one copy of Student Sheet 75 for each student.
- Have paper and pencils available.

Lesson 7: Geometry

Say:

In Lesson 1 of Geometry, you learned about right, obtuse, acute, and straight angles. In this lesson, you will learn about other types of angles. Remember that an *acute angle* has a measure of more than 0° , but less than 90° . A *right angle* has a measure of exactly 90° . An *obtuse angle* has a measure of more than 90° , but less than 180° . A *straight angle* has a measure of exactly 180° . What does a straight angle look like? (a straight line)

If the sum of the measures of two angles is 90° , the angles are called *complementary angles*.

If the sum of the measures of two angles is 180° , the angles are called *supplementary angles*.

] Give Student Sheet 75, problems 1 – 5 to the students.

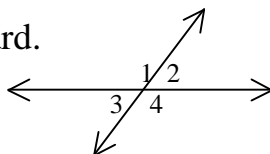
Say:

When naming angles, sometimes it is correct to use just one letter. You could write ? A and someone else would understand to which angle you are referring. But what if you write ? B? Do you mean the angle that measures 180° or do you mean the angle in ? DBA or the angle in? DBC? If confusion can arise when naming an angle, be sure to name it with 3 points. Remember that the middle point must be the point at the vertex. ? ADB is not the same angle as ? ABD.

Answers: Answers may vary.

- | | | |
|-----------------------|--------------------------|---------------|
| 1. A. ? ADB and ? CDB | B. ? ABD and ? CBD | |
| 2. A. ? DAE and ? BAE | B. ? ADE and ? CDE, etc. | |
| C. ? DEA and ? BEA | D. ? BEA and ? BEC, etc. | |
| 3. A. ? AFB and ? BFE | B. ? BEF and ? CEB | |
| C. ? FBE and ? CBE | D. ? ECD and ? ECB | |
| 4. A. 1° | B. 45° | C. 75° |
| 5. A. 91° | B. 90° | C. 1° |

Draw this figure on the board.



Say:

When two lines intersect, *vertical angles* are formed. *Vertical angles* are angles on opposite sides of the intersection of two lines. On my drawing on the board, $\angle 1$ and $\angle 4$ are vertical angles and $\angle 3$ and $\angle 2$ are vertical angles. Vertical angles are congruent, or have the same measure.

Give problem 6 on Student Sheet 75.

Answers: 6. $\angle a$ and $\angle f$, $\angle b$ and $\angle e$, $\angle c$ and $\angle h$, $\angle g$ and $\angle d$

Say:

Sometimes, when we are given a figure that has some of the measures of the angles shown, we can find the measures of the other angles. It helps to remember that the measures of the three angles in a triangle must equal 180° .

Give problem 7 on Student Sheet 75.

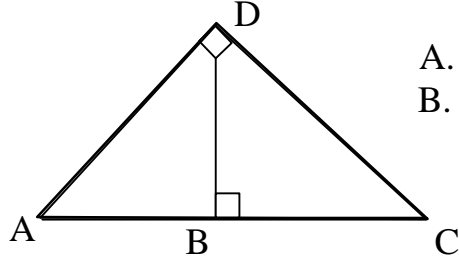
Answers

7. A. 45° B. 90° C. 158° D. 113°
E. 67° F. 68°

Have one student summarize today's lesson. The ideas of complementary, supplementary, and vertical angles will come up again in the next lesson.

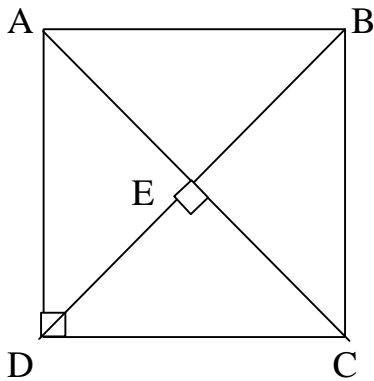
Student Sheet 75 (Geometry: Lesson 7)

1. In the figure below name two angles that are complementary and two that are supplementary. Be careful when naming your angles.



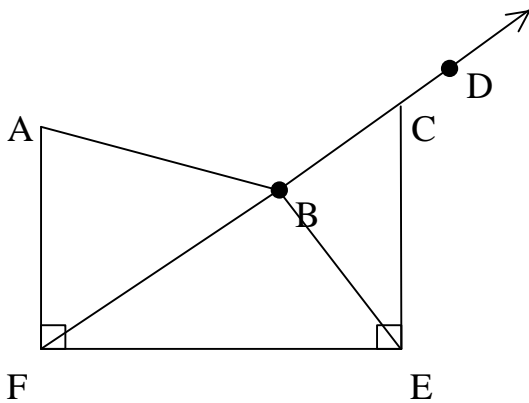
- A. Complementary _____
 B. Supplementary _____

2. In the figure below, name two pairs of angles that are complementary and two pairs of angles that are supplementary.



- A. Complementary _____
 B. Complementary _____
 C. Supplementary _____
 D. Supplementary _____

3. In the figure below, name two pairs of angles that are complementary and two pairs of angles that are supplementary.



- A. Complementary _____
 B. Complementary _____
 C. Supplementary _____
 D. Supplementary _____

Student Sheet 75 (Geometry: Lesson 7) continued

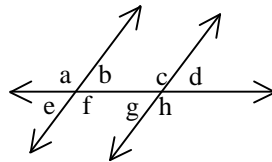
4. State the angle measure that is complementary to the given angle.

- A. 89° B. 45° C. 15°

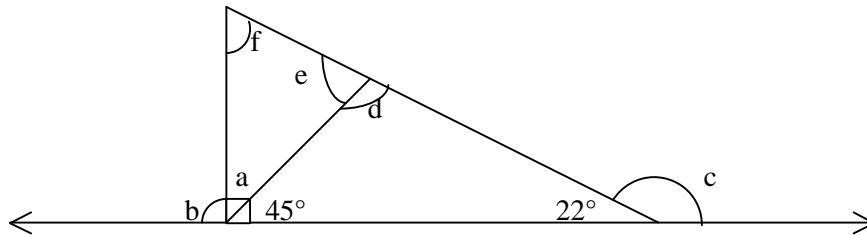
5. State the angle measure that is supplementary to the given angle.

- A. 89° B. 90° C. 179°

6. Name the pairs of vertical angles in the figure below.



7. In the figure below, find the measure of the missing angles.



- A. ? a measures _____ $^\circ$
 B. ? b measures _____ $^\circ$
 C. ? c measures _____ $^\circ$
 D. ? d measures _____ $^\circ$
 E. ? e measures _____ $^\circ$
 F. ? f measures _____ $^\circ$