

Grade 8 Mathematics

Geometry: Lesson 8

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 8:

- In this lesson, the tutor and the students will
 - ✓ identify corresponding, alternate interior, and alternate exterior angles; and
 - ✓ find the measures of unknown angles.

Equipment/Materials Needed:

- Copies of Student Sheet 76
- Paper and pencils
- Chalkboard

Preparations before beginning Lesson 8:

- Run one copy of Student Sheet 76 for each student.
- Have paper and pencils available.

Lesson 8: Geometry

Say:

In Geometry, Lessons 1 and 7, you learned about angles: acute, obtuse, right, straight, complementary, supplementary, and vertical angles. In Lesson 1, you also learned about parallel lines. *Parallel lines* are lines that never cross and that always stay the same distance apart. Sometimes a 3rd line intersects two parallel lines. This line is called a *transversal*. When a transversal line intersects two parallel lines, angles are formed. Many of these angles have special relationships.

Give Student Sheet 76 to the students. Have them work problems 1 – 4.

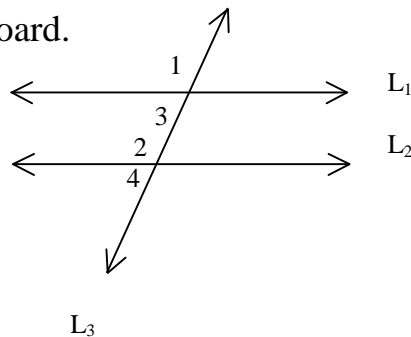
Answers:

- 8
- Supplementary angles
- Supplementary angles
- ? a and ? d, ? b and ? c, ? e and ? h, ? g and ? f

Say:

The problems 1 – 4 reviewed supplementary and vertical angles. There are other angle relationships that are formed by the intersection of a transversal and two parallel lines.

Draw this figure on the board.



Say:

Lines L_1 and L_2 are parallel to each other. L_3 is a transversal line that intersects L_1 and L_2 . *Corresponding angles* are angles that are on the same side of a transversal, but one angle is between the parallel lines and one angle is outside of the parallel lines.

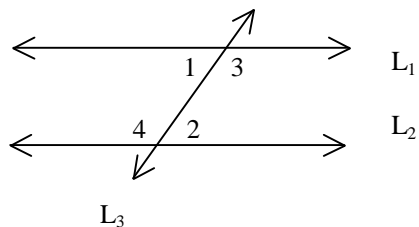
In my drawing, ? 1 and ? 2 are corresponding angles and ? 3 and ? 4 are corresponding angles. Corresponding angles are congruent.

Give Problem 5 of Student Sheet 76 to the students.

Answers:

5. $\angle a$ and $\angle e$, $\angle b$ and $\angle f$, $\angle c$ and $\angle g$, $\angle d$ and $\angle h$

Draw this figure on the board.



Say:

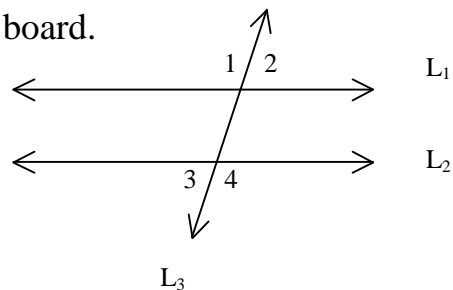
Lines L_1 and L_2 are parallel to each other. L_3 is a transversal line that intersects L_1 and L_2 . *Alternate interior angles* are angles that are between the two parallel lines, but are on opposite sides of the transversal. $\angle 1$ and $\angle 2$ are alternate interior angles, as well as $\angle 3$ and $\angle 4$. Try to get the students to make sense of the name. Remember that these angles are “between” or “interior,” and that they are on alternate sides of the transversal. Alternate interior angles are congruent.

Give problem 6 of Student Sheet 76 to the students.

Answers:

6. $\angle c$ and $\angle f$, $\angle d$ and $\angle e$

Draw this figure on the board.



Say:

Lines L_1 and L_2 are parallel to one another. L_3 is a transversal line that intersects L_1 and L_2 . *Alternate exterior angles* are the angles above and below the parallel lines (not “between” the lines, but “exterior” to them) and ones that on opposite sides of the transversal. Try to get the students to make sense of the name. ? 1 and ? 4 are alternate exterior angles, as well as ? 2 and ? 3. Alternate exterior angles are congruent.

└ Give Problem 7 on Student Sheet 76 to the students.

Answers:

7. ? a and ? h, ? b and ? g

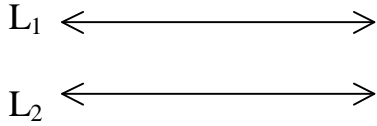
└ Give Problem 8 on Student Sheet 76 to the students. On this problem, students must find the measures of the missing angles.

8. A. 110° ; vertical angles
B. 110° ; alternate interior angles or corresponding angles
C. 70° ; supplementary angles
D. 110° ; vertical angles or corresponding angles

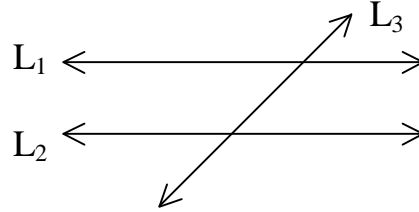
└ Have one student summarize today’s lesson. The different types of angle relationships are generally not hard for students to understand. The students simply forget or confuse the names of the relationships.

Student Sheet 76 (Geometry: Lesson 8)

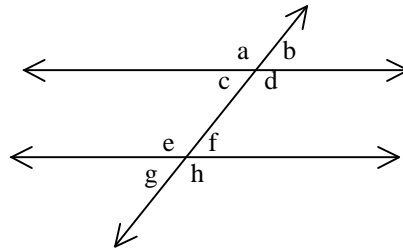
In the drawing below,
 L_1 and L_2 are parallel



A third line intersects these 2 lines.
 It is called a transversal.

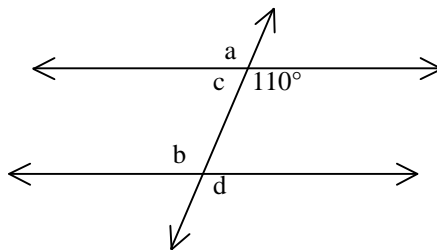


- How many angles are formed by the intersection of L_3 with L_1 , and L_2 ?
 Let's name them as a, b, c, d, e, f, g, and h.



Use the figure above for Problems 2 – 7.

- What are ? a and ? b called?
- What are ? a and ? c called?
- Find the pairs of vertical angles.
- Find the pairs of corresponding angles.
- Find the pairs of alternate interior angles.
- Find the pairs of alternate exterior angles.
- Find the measures of the missing angles in the figure below. Explain your reasoning.



- A. the measure of ? a = _____ B. the measure of ? b = _____
 C. the measure of ? c = _____ D. the measure of ? d = _____