Side to Side

Reporting Category	Geometry
Topic	Determining congruence of geometric figures
Primary SOL	6.12 The student will determine congruence of segments, angles, and polygons.

Materials

- Pairs of congruent and noncongruent geometric figures (line segments, angles, and polygons) for display
- Congruence handout (attached)
- Rulers
- Protractors
- Transparencies
- Dot paper

Vocabulary

line segment, polygon, angles (earlier grades)

congruent (6.12)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Display a chart with two columns, one labeled "Congruent" and the other labeled "Noncongruent." Begin a discussion about congruent geometric figures, showing students various pairs of line segments, angles, and polygons and placing them in the correct columns on the chart. Ask students to look closely at the pairs of figures placed in each category and think about what they notice. Continue to display more pairs of figures, and ask students to decide as a group to which category they belong.
2. Ask students to create a class definition of the term *congruent,* based on the examples shown. Ensure that all students understand the concept of congruence. Then, ask students to explain what *noncongruent* means. List student responses on the board and discuss.
3. Explain to students that they will compare geometric figures and determine whether they are congruent. Group students into pairs, and have pairs create and write down a procedure for determining whether pairs of segments, angles, and polygons are congruent. Encourage them to be creative and very specific with their methods. They do not need to test their theories at this time, but only put them in writing. Allow students to share the methods they created.
4. Distribute copies of the attached Congruence handout, and instruct students to experiment with their chosen method to determine whether it is effective. (Note: At this point, do not discourage any methods.) Provide students with any materials they may need to test their methods (e.g., rulers, protractors, tracing paper, dot paper). Have students do a sample of the problems on the handout, including one for each type of geometric figure.

5. Have students state in writing whether or not their methods worked and explain why they think they worked or did not work.
6. Allow pairs of students who found effective methods to explain and demonstrate them to the class. At this point, share how to determine congruence of two polygons by comparing the measures of their sides and angles, if this method has not yet been presented. Make this one of the required methods to use when revising work.
7. Have students revise their handouts, if necessary, using one or more of the methods determined to be effective. Have them also complete any problems on the handout that have not yet been done.

Assessment

- **Questions**
  - What method did you decide to use to determine congruence? How did you decide to use that method? Did it work? Why, or why not?
  - Can you tell just by looking at two figures whether they are congruent? Why, or why not?
  - How do you know when two figures are congruent?
  - How do you know when two figures are noncongruent?
- **Journal/Writing Prompts**
  - Explain congruence and how you can determine the congruence of any two geometric figures. Include examples.
  - Describe a method you used to determine congruence of two geometric figures. Explain why it worked or did not work.
  - Given two congruent figures, explain what you can say about how the figures are related.
  - Given two congruent polygons, explain what you can say about how the polygons are related.
- **Other**
  - Use students' work on the Congruence handout as an assessment.

Extensions and Connections (for all students)

- Have students locate congruent geometric figures throughout the classroom.
- Create index cards with different pairs of geometric figures. Have students sort the pairs into "Congruent" and "Noncongruent" categories.
- Have students identify congruent shapes found throughout their homes.
- Invite a landscaper or a contractor to the class to speak about the importance of congruence in his/her job.

Strategies for Differentiation

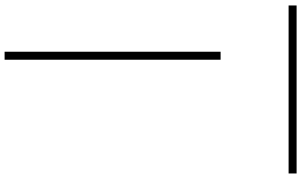
- Allow students to use patty paper to trace polygons, angles, and segments to determine congruence.

Congruence

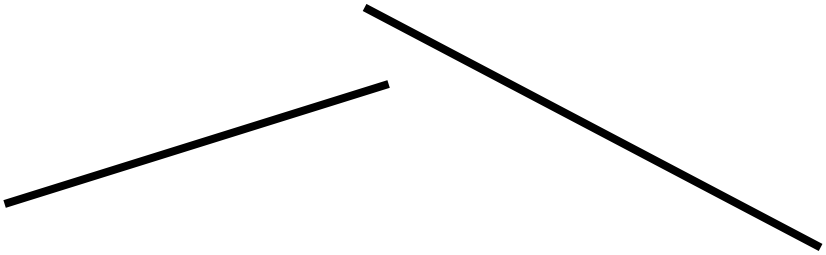
Name _____ **Date** _____

A. Determine whether each pair of lines is congruent or noncongruent. Write your answer in the space provided, and explain the method you used to determine congruence.

1. _____

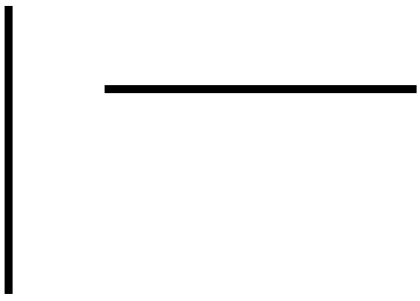


2. _____



3. _____

4. _____



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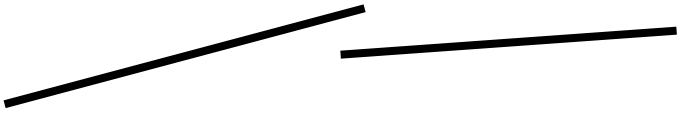
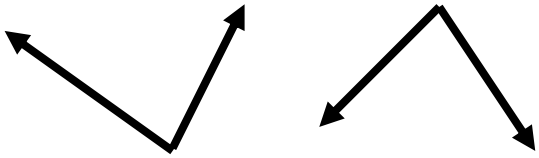
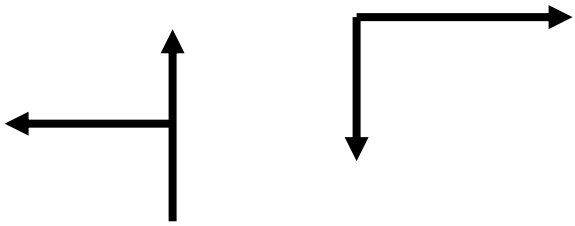


B. Determine whether each pair of angles is congruent or noncongruent. Write your answer in the space provided, and explain the method you used to determine congruence.

1. _____



2. _____



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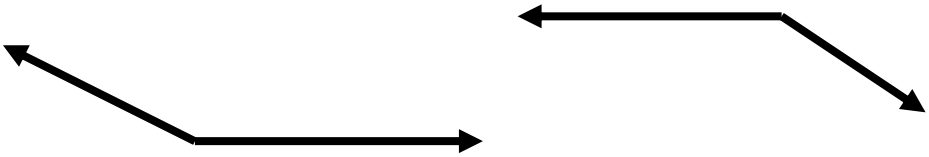
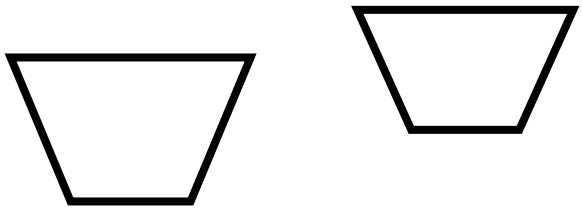


C. Determine whether each pair of polygons is congruent or noncongruent. Write your answer in the space provided, and explain the method you used to determine congruence.

1. _____



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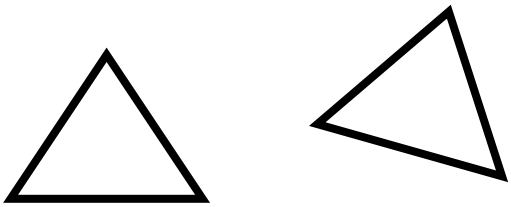

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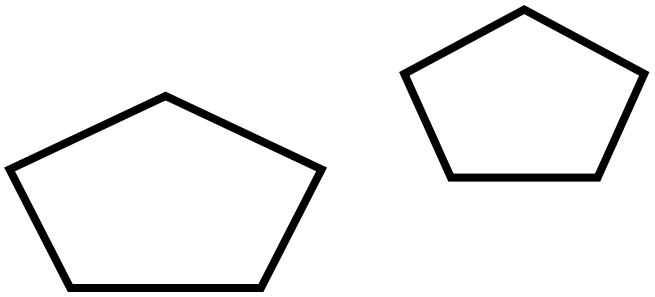

4. _____