

5.5

# Triangle Inequalities

## Investigation 1

Go to the my sketchpad website and open the link/file “5.5 – Triangle Inequalities”

Make $\overline{AB}$ the longest side. What's the biggest angle? _____	Make $\overline{BC}$ the longest side. What's the biggest angle? _____	Make $\overline{CA}$ the longest side. What's the biggest angle? _____
Make $\overline{AB}$ the shortest side. What's the smallest angle? _____	Make $\overline{BC}$ the shortest side. What's the smallest angle? _____	Make $\overline{CA}$ the shortest side. What's the smallest angle? _____

## SIDE-ANGLE INEQUALITY POSTULATE



**POK**

In a triangle, the \_\_\_\_\_ side is  
opposite the angle with the biggest measure,  
and the shortest side is \_\_\_\_\_ the  
\_\_\_\_\_ measure.

## Investigation 2

- 1) Currently, is the sum of  $\overline{AB}$  and  $\overline{BC}$  greater or lesser than  $\overline{CA}$ ? \_\_\_\_\_
- 2) Drag point B of the triangle closer and closer to  $\overline{CA}$ . What happens to the sum of  $\overline{AB}$  and  $\overline{BC}$  compared to the measure of  $\overline{CA}$ ?
- 3) Drag point B of the triangle and to try to make the calculated sum equal to the length of  $\overline{CA}$ . What happens to the triangle? Is it still a triangle?
- 4) Do you think that it's possible for the sum of the lengths of any two sides of a triangle to be less than the side of the third side? Explain.

## TRIANGLE INEQUALITY POSTULATE



The sum of the lengths of any two sides of a triangle is \_\_\_\_\_ the length of the \_\_\_\_\_ side.

# CLASSWORK

In Exercises 1–4, determine whether it is possible to draw a triangle with sides of the given measures. If it is possible, write yes. If it is not possible, write no

**1.** 16 cm, 30 cm, 45 cm

**2.** 9 km, 17 km, 28 km

**3.** 32 in., 60 in., 87 in.

**4.** 13.4 ft, 17.7 ft, 31.1 ft

# CLASSWORK

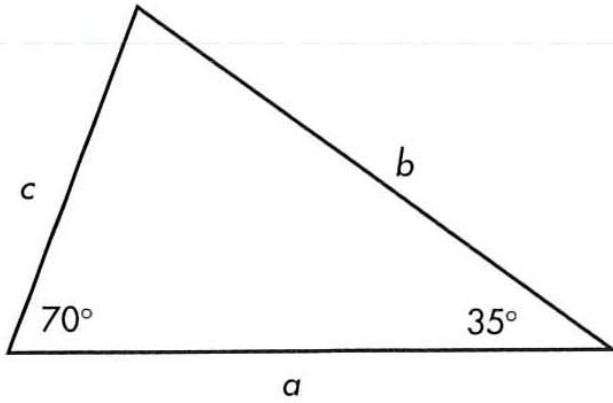
The following are the sides of a triangle. What is the possible range of measurements of the third side?

5) 4 and 7

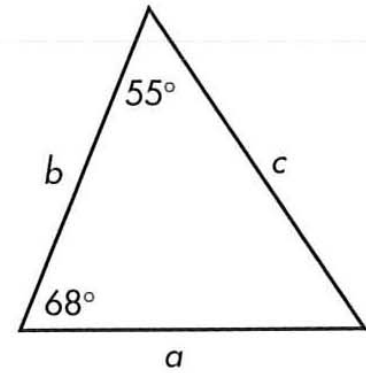
6) 10 and 2

Arrange the unknown measures from greatest to least.

7.\*

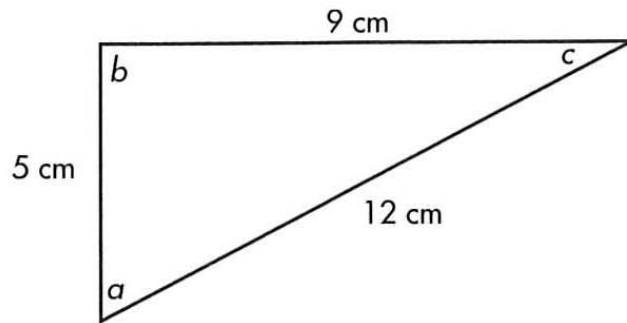


8.

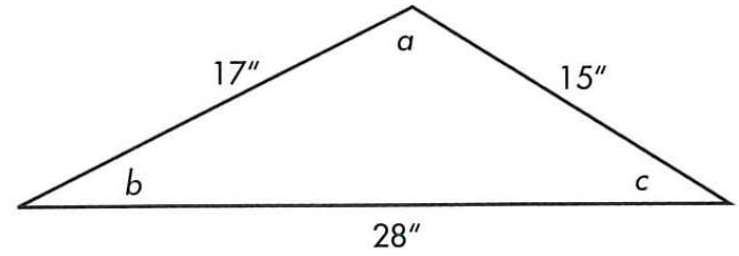


Arrange the unknown measures from greatest to least.

9.



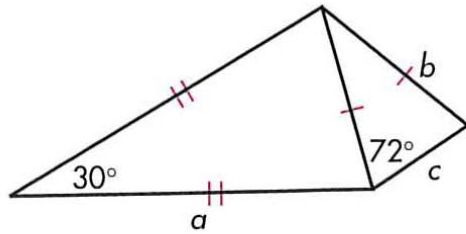
10.





Arrange the unknown measures from greatest to least.

11.



12.

