Geometry

5.5 Use Inequalities in a Triangle

opposite

angle

side

longer

side

If one \_\_\_\_\_\_\_\_\_\_\_ of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than another \_\_\_\_\_\_\_\_, then the \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ the \_\_\_\_\_\_\_\_\_\_\_ side is \_\_\_\_\_\_\_\_\_\_\_ than the angle opposite the shorter side.

larger

longer

larger

side

angle

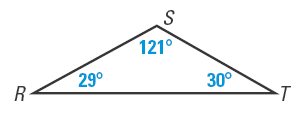
larger

angle

If one \_\_\_\_\_\_\_\_\_\_\_ of a triangle is \_\_\_\_\_\_\_\_\_\_\_ than another \_\_\_\_\_\_\_\_, then the \_\_\_\_\_\_\_\_ opposite the \_\_\_\_\_\_\_\_\_\_\_ angle is \_\_\_\_\_\_\_\_\_\_\_\_ than the side opposite the smaller angle.

longer

List the sides in order from shortest to longest.



## Triangle Inequality Theorem

third

length

greater

sides

sum

The \_\_\_\_\_\_\_ of two \_\_\_\_\_\_\_\_\_ of a triangle is \_\_\_\_\_\_\_\_\_\_\_\_ than the \_\_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_ side.

AB + BC > AC; AB + AC > BC; BC + AC > AB

A triangle has one side of 11 inches and another of 15 inches. Describe the possible lengths of the third side.

11 + x > 15 🡪 x > 4

15 + x > 11 🡪 x > -4 (not useful)

11 + 15 > x 🡪 26 > x

Combine 1st and 3rd: 4 < x < 26

Find all possible values of x.

x + 11

5x – 9

2x + 10

x + 11 + 2x + 10 > 5x – 9 🡪 3x + 21 > 5x – 9 🡪 30 > 2x 🡪 15 > x

2x + 10 + 5x – 9 > x + 11 🡪 7x + 1 > x + 11 🡪 6x > 10 🡪 x > 10/6 🡪 x > 1

x + 11 + 5x – 9 > 2x + 10 🡪 6x + 2 > 2x + 10 🡪 4x > 8 🡪 x > 2

Choose narrowest interval: 2 < x < 15

Assignment: 331 #2, 6-34 even, 40-44 even, 49, 52, 54 = 22 total