

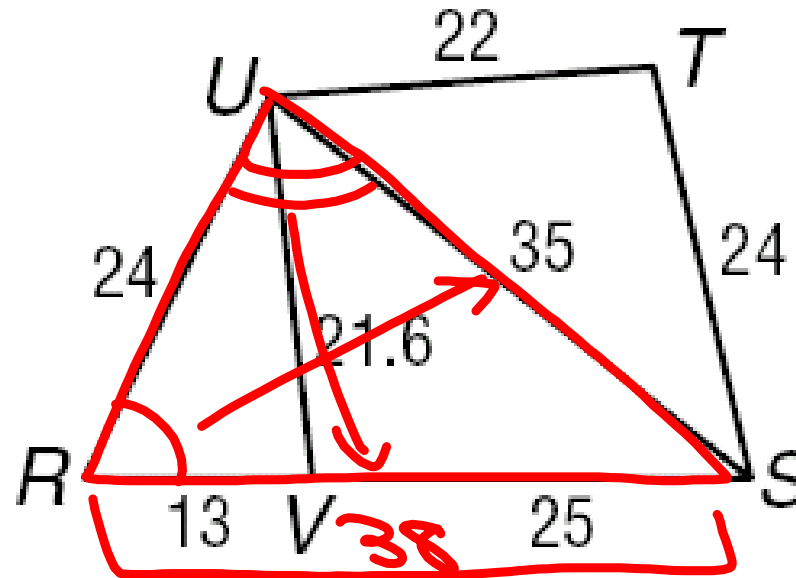
# 11/22/19 - Warm Up Problem

Fill in the blank with a  $<$  or  $>$  sign.

$$\angle T \underline{>} \angle TUS$$

$$\angle UVS \underline{>} \angle VSU$$

$$\angle R \underline{<} \angle RUS$$



## Section 5.6 - Inequalities in 1 Triangle

**Goal:** Determine if 3 sides will form a triangle and find a range for the 3rd side when given 2 sides

### Spaghetti Geometry!

Can you make a triangle out of any three pieces or do they have to be certain lengths?

- Cut five pieces of spaghetti to be 3 inches, 4 inches, 5 inches, 7 inches, and 8 in.
- Use the 3 in, 4 in, and 5 in. pieces.
  - do they make a triangle? **Yes**
- Use the 3 in, 4 in, and 7 in. pieces.
  - do they make a triangle? **?**
- Use the 3 in, 4 in, and 8 in. pieces.
  - do they make a triangle? **NO**

$$\begin{array}{r} 3 \quad 4 \\ \hline \hline 7 \end{array}$$

$$\begin{array}{r} 8, 7, 3 \\ \hline \hline \end{array}$$

$$\begin{array}{r} 8, 7, 5 \\ \hline \hline \end{array}$$

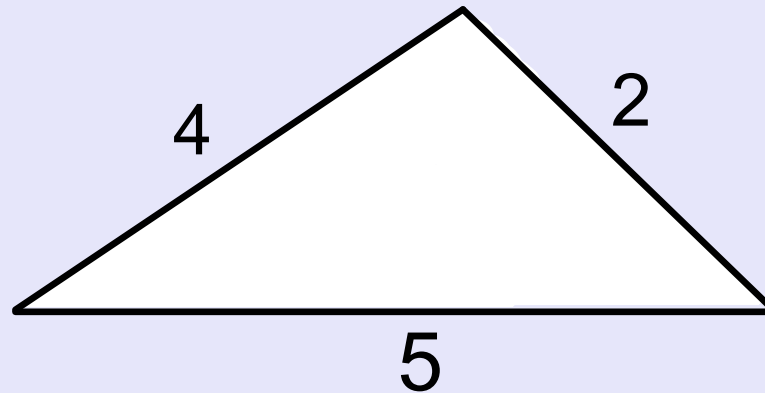
$$\begin{array}{r} 8, 7, 4 \\ \hline \hline \end{array}$$

~~$$\begin{array}{r} 8, 5, 3 \\ \hline \hline \end{array}$$~~

$$\begin{array}{r} 5, 7, 8 \\ \hline \hline \end{array}$$

## Triangle Inequality Theorem

The **sum** of the lengths of **any two sides** of a triangle is **greater** than the length of the **third side**.



**To simplify: The sum of the shortest two sides must be greater than the longest side**

## Use the Triangle Inequality Theorem

Determine if sides of the given lengths would form a triangle.

1. 12 cm, 8 cm, 9 cm **Yes**

2. 4.2 in, 4.2 in, 8.4 in **No**

3. 10 ft, 6 ft, 3 ft **No**

## Find a Range of Possible Lengths

A triangle has sides that are 8 cm and 10 cm long.  
Write a range of possible lengths for the third side.

Step 1: What if the missing side is the longest side?

$$8 + 10 > x$$

$$18 > x$$

Step 2: What if the missing side is one of the shorter ones?

$$\begin{array}{r} x + 8 > 10 \\ - 8 \quad - 8 \\ \hline \end{array} \quad x > 2$$

Step 3: Write it as a compound inequality.

$$2 < x < 18$$

Write a compound inequality to answer each question.

A triangle has sides of lengths 3 in. and 12 in. Describe the lengths possible for the third side.

Do this one in your notes...

Two sides of a triangle have lengths 5 cm and 9 cm. Find a possible range for the length of the third side. Write your answer as a compound inequality.

$$4 < x < 14$$

$9 - 5 \rightarrow$        $\leftarrow 9 + 5$

## Assignment:

pg. 329 due by Tuesday 11/26

(21-32)

(37-39)

Section 5-6

② 2 in, 3 in, 6 in

NO  $2+3 \neq 6$