

Name Key

Date _____

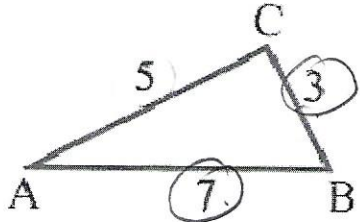
Triangle Properties
DO NOW

**Can just add 2 smallest*

Sides to do it quicker!

Theorem 1:

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



$$\begin{aligned} AC + CB &> AB & 5 + 3 &> 7 \\ CB + AB &> AC & 3 + 7 &> 5 \\ AB + AC &> CB & 7 + 5 &> 3 \end{aligned}$$

If these inequalities are NOT true, you do not have a triangle!



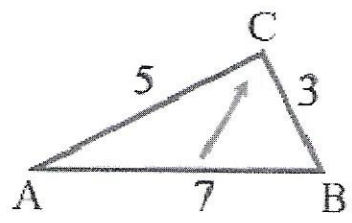
Theorem 2:

In a triangle, the longest side is across from the largest angle.

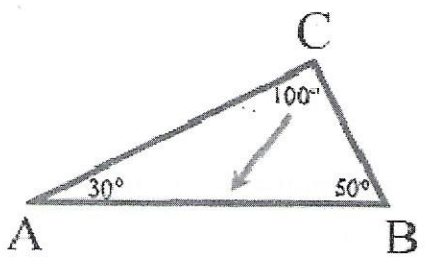
also ...

Theorem 3:

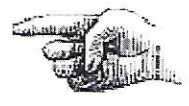
In a triangle, the largest angle is across from the longest side.



Since 7 is the longest side in the triangle, $\angle C$, across from it, is the largest angle.



Since 100° is the largest angle in this triangle, \overline{AB} , across from it, is the longest side.



State if the three numbers can be the measures of the sides of a triangle.

1) 7, 5, 4 $7+5=12$ $12 > 4$ ✓
 $7+4=11$ $11 > 5$ ✓
 $5+4=9$ $9 > 7$ ✓ **Yes**

2) 3, 6, 2 $3+6=9$ $9 > 2$ ✓
 $6+2=8$ $8 > 3$ ✓
 $3+2=5$ $5 < 6$ **No**

3) 5, 2, 4 $5+2=7$ $7 > 4$ ✓
 $5+4=9$ $9 > 2$ ✓
 $4+2=6$ $6 > 5$ ✓ **Yes**

4) 8, 2, 8 $8+2=10$ $10 > 8$ ✓
 $8+8=16$ $16 > 2$ ✓ **Yes**