

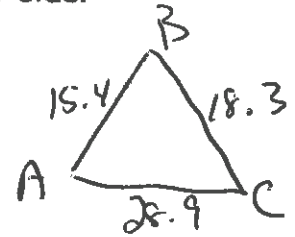
Inequalities in Triangles

THEOREM 5-10: In a triangle, the larger angle lies opposite the larger side.

Example: In Triangle ABC, $BC = 18.3$ cm, $AB = 15.4$ cm, $AC = 28.9$ cm.

Which **angle** is the:

Smallest? $\angle C$
 Midsize? $\angle A$
 Largest? $\angle B$



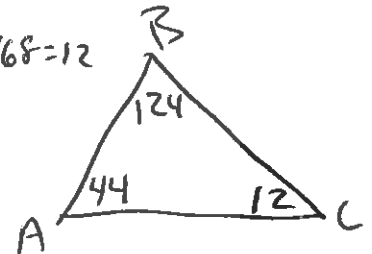
CONVERSE: In triangle, the larger side lies opposite the larger angle.

Example: In Triangle ABC, $m\angle A = 44$ and $m\angle B = 124$.

$\angle C = 180 - 168 = 12$

Which **side** is the:

Smallest? AB
 Midsize? BC
 Largest? AC



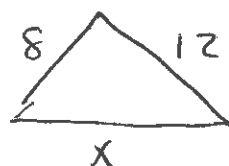
THEOREM 5-12: *The Triangle Inequality Theorem*

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

Example 1: Which of the following can represent the sides of a triangle?

<p>a) {2,3,6} no</p> <p>$2+3 > 6$ (circled in red) $2+6 > 3$ $3+6 > 2$</p>	<p>b) {10,6,12} yes</p> <p>$10+6 > 12$ $10+12 > 6$ $6+12 > 10$ yes.</p>	<p>c) {7,3,10} no</p> <p>$7+3 > 10$ (circled in red) no $3+10 > 7$ $7+10 > 3$</p>	<p>d) {9,9,14} yes</p> <p>$9+9 > 14$ $9+14 > 9$ $9+14 > 9$ yes.</p>
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Example 2: $\triangle ABC$ has sides of lengths 8, 12, and x . Find all the possible values of x ?



$8+12 > x$ → $20 > x$
 $x+8 > 12$ → $x > 4$
 $x+12 > 8$ → Don't need.
4 < x < 20