<name>
Class: Honors Geometry
Date: <date>
Topic: Lesson 5-5 (Inequalities in Triangles)

Addition POI

If $a > b$ and $c \geq d$, then $a + c > b + d$

Multiplication POI

If $a > b$ and $c > 0$, then $ac > bc$
If $a > b$ and $c < 0$, then $ac < bc$

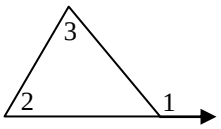
Transitive POI

If $a > b$ and $b > c$, then $a > c$

Comparison POI

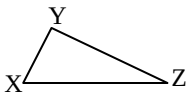
If $a = b + c$ and $c > 0$, then $a > b$

Corollary



<u>Corollary to the Triangle Ext Angle Thm</u>
The measure of an ext $\angle$ of a Δ is greater than measure of ea of its remote int $\angle$'s - $m\angle 1 > m\angle 2$ and $m\angle 1 > m\angle 3$

Theorem 5-10

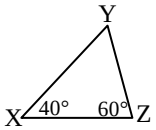


If 2 sides of Δ are not $\cong$ then larger side lies opp. larger $\angle$: If $XZ > XY$ then $m\angle Y > m\angle Z$.

Theorem 5-11

If 2 $\angle$'s are not $\cong$ then larger sides lies opp. larger $\angle$.
If $m\angle Y > m\angle Z$ then $XZ > XY$.

Example

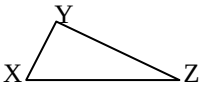


<u>Pg 275 Check Understanding 3</u>
List sides of ΔXYZ shortest to largest. Explain.
$m\angle Y = 80$ thus $YZ < XY < XZ$

Theorem 5-12

<u>Triangle Inequality Theorem</u>
Sum of lens of any 2 sides of Δ is greater than len of 3rd side.

$XY + YZ > XZ$
$YZ + XZ > XY$
$XZ + XY > YZ$



Example

<u>Pg 276 Check Understanding 4</u>
Can a Δ have the given lens? Explain.

a) 2m, 7m, and 9m - no; $2+7$ is not greater than 9
b) 4yd, 6yd, and 9yd - yes; $4+6>9; 6+9>4; 4+9>6$

Example

<u>Pg 276 Check Understanding 5</u>
A Δ has sides len 3in & 12in. Desc lens possible for 3rd side.
12 + 3 = 15 so the 3rd side must be less than 15.
12 – 3 = 9 so the 3rd side must be greater than 9.
Therefore $9 < x < 15$