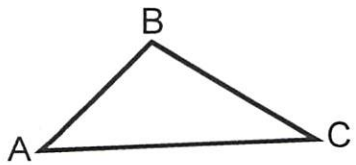
H.W pg 348 14-22
pg 367 7-17 odd #21

5.5 Inequalities in one Triangle

5.3 Angle Side Relationships in Triangles

Objective: To use the triangle inequality theorem to identify possible triangles
To recognize and apply properties of inequalities to the relationships between the angles and sides of a triangle

Triangle Inequality Theorem: The sum of any two sides of a triangle must be greater than the 3rd side.



$AB+BC > AC$
$BC+AC > AB$
$AC+AB > BC$

1. Is it possible to have a triangle with the following 3 side lengths?

a) 5, 2, 4 $2+4>5$ yes, $5+2>4$, $5+4>2$

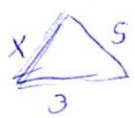
b) 5, 2, 3 $2+3>5$ NO

c) 5, 2, 2 $2+2>5$ NO

d) 5, 2, 5 $2+5>7$ yes

2. Write an inequality statement to represent the range of possible lengths for the 3rd side of a triangle(x).

a) 3 and 5



$x+3>5$, $x>2$; $x+5>3$, $x>-2$; $5+3>x$, $8>x$ or $x<8$

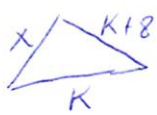
$2<x<8$

★ 8 and 11

$x+8>11$, $x>3$; $x+11>8$, $x>-3$; $8+11>x$, $x<19$

$3<x<19$

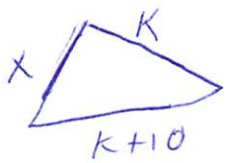
b) k and k + 8



$x+k>k+8$, $x>8$; $x+k+8>k$, $x>-8$; $k+8+k>x$, $2k+8>x$

$8<x<2k+8$ $x<2k+8$

you try: k and k + 10

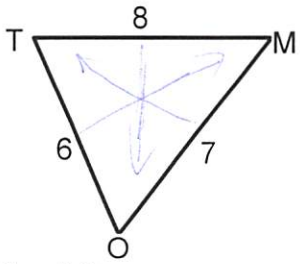


$x+k+10>k$, $x>-10$; $x+k>k+10$, $x>10$; $k+k+10>x$, $2k+10>x$

$10<x<2k+10$
$10<x<2k+10$

Section 5.3 (Theorems on pg. 346)

Theorem 5.9: In a triangle, if one side is longer than another side **then** the bigger angle will be across from the longer side.

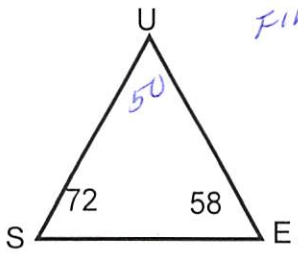


observe: TO < MO < IM

conclude: ∠M < ∠T < ∠O

Section 5.3

Theorem 5.10: In a triangle, if one angle is larger than another angle, **then** the longer side will be across from the bigger angle.



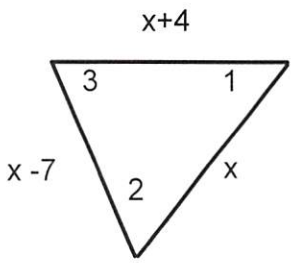
FIND U

observe: ∠U < ∠E < ∠S

conclude: SE < SU < UE

Practice:

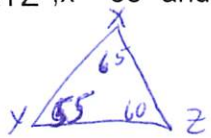
3. Name the largest angle:



it is opposite the longest side

∠2

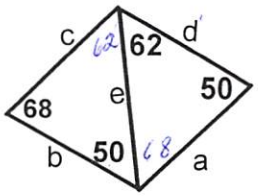
4. In △ XYZ ,x = 65° and ,y = 55° Name the shortest side.



65 + 55 = 120

XZ is smallest since its opposite smallest angle

5. Write lenghts a,b,c,d,e from smallest to largest

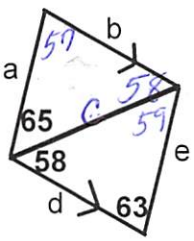


62 + 50 = 112

c < b < e

e < a < d

answer: c < b < e < a < d



58 + 63 = 121

180 − 121 = 59

65 + 58 = 123

180 − 123 = 57

ANSWER

e < d < c < a < b

c < a < b

e < d < c

if time kids do #20 pg 367