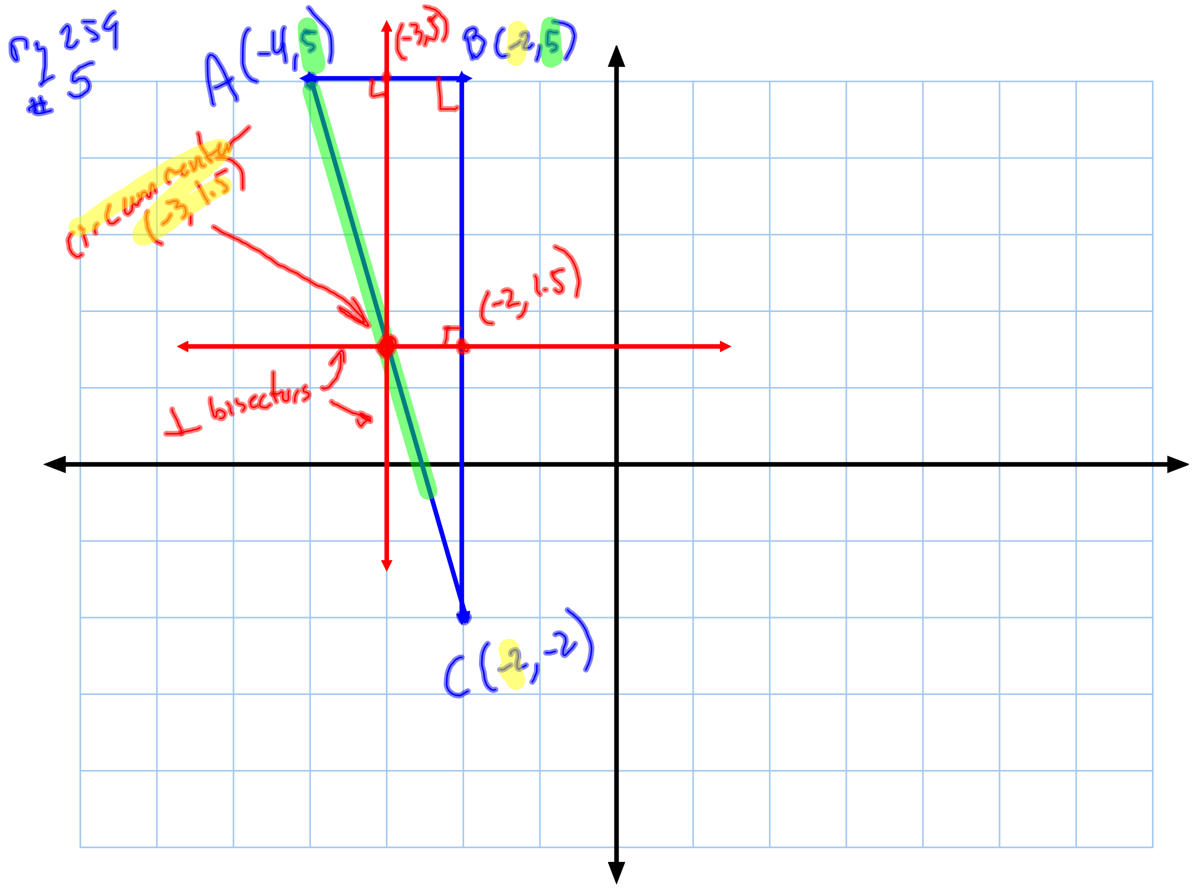
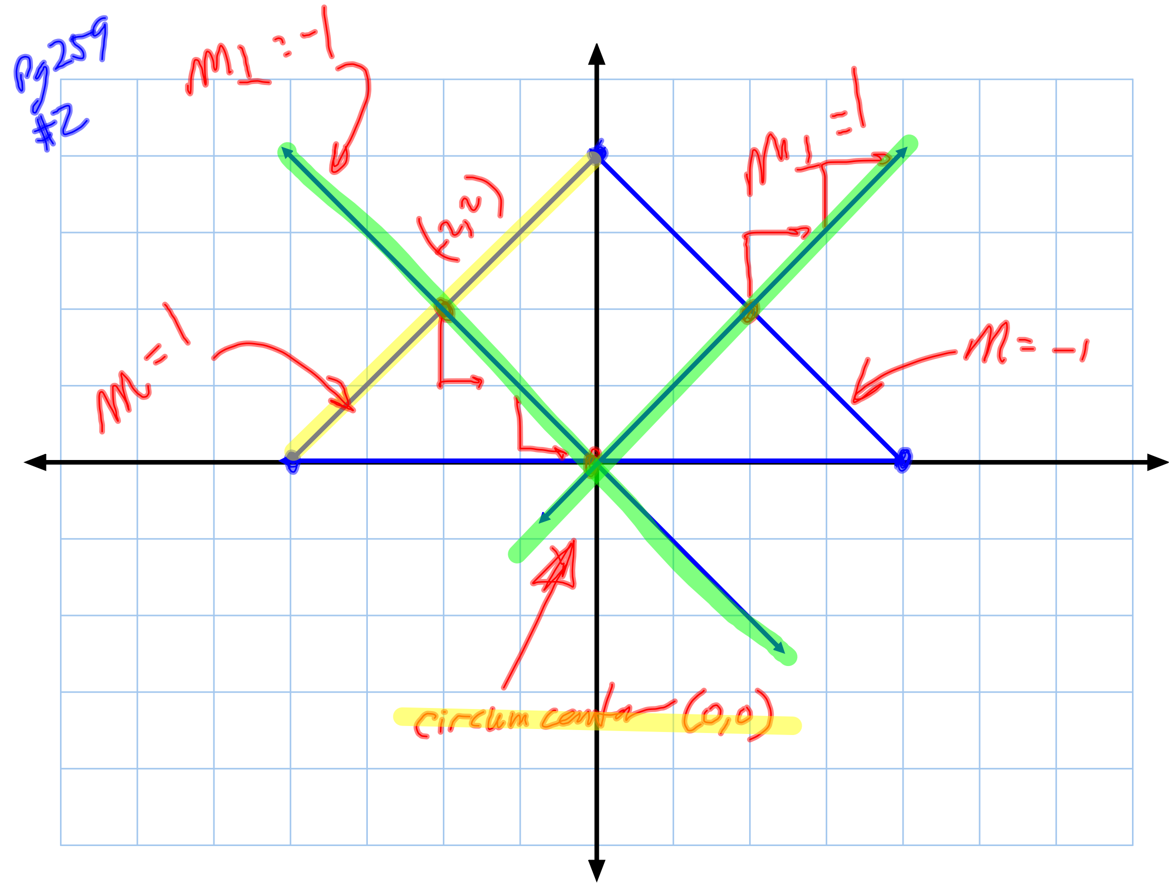


Pg 259
#5
A(-4,5)
(-3,5)
B(-2,5)
circum center
(-3, 1.5)
(-2, 1.5)
⊥ bisectors
C(-2,-2)



Pg 259
#2
m⊥ = -1
(-2,2)
m⊥ = 1
m = 1
m = -1
circum center (0,0)

What is...

...an ***equality?*** =

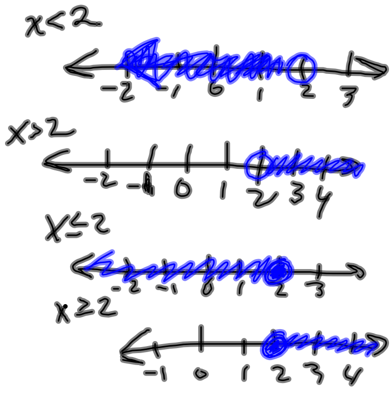
...an ***inequality?***

< less than

> greater than

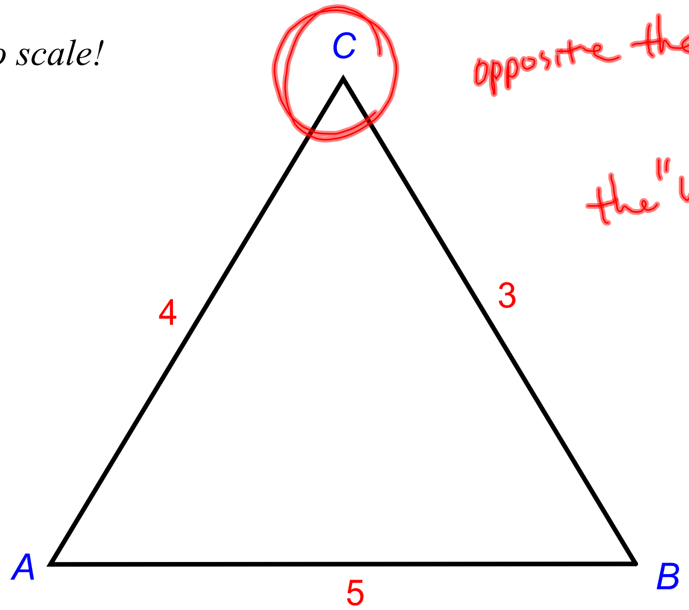
≤ less than or equal

≥ greater than or equal



Which ∠ is largest?

Not drawn to scale!



opposite the longest side

↓

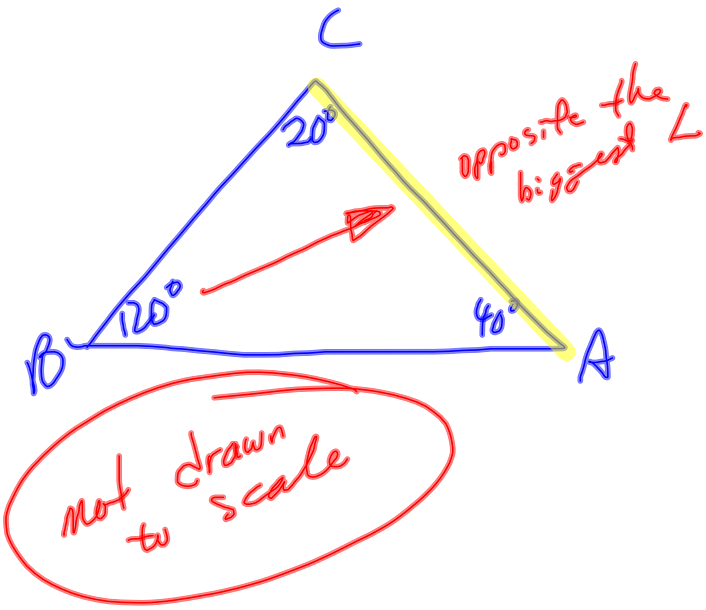
the "widest open"

Which side is longest?

ΔABC: $m\angle A = 40$

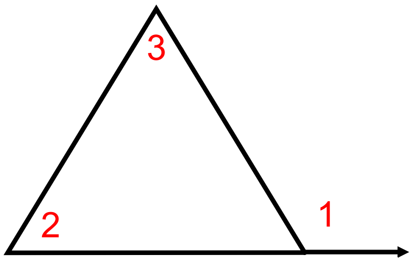
$m\angle B = 120$

$m\angle C = 20$

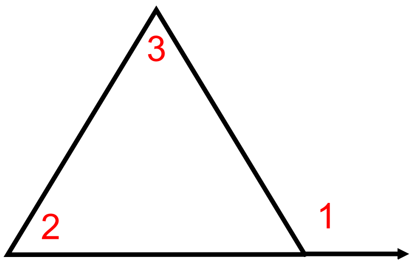


Do you recall the Triangle Exterior $\angle$ Theorem?

Do you recall the Triangle Exterior ∠ Theorem?

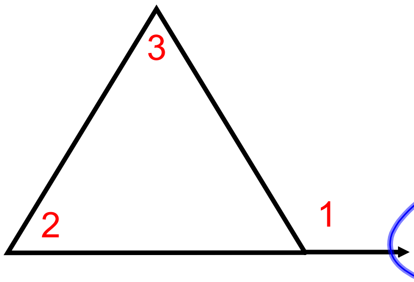


Do you recall the Triangle Exterior ∠ Theorem?



$m\angle 1 = ?$

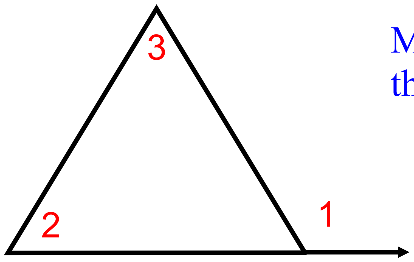
Do you recall the Triangle Exterior ∠ Theorem?



$m\angle 1 = m\angle 2 + m\angle 3$

~~5 = 2 + 7~~

Corollary to Triangle Exterior ∠ Theorem



Measure of an exterior ∠ is greater than the measure of either remote interior ∠.

$m\angle 1 > m\angle 2$

$m\angle 1 > m\angle 3$

Properties of Inequality

Addition POI

Properties of Inequality

Addition POI if $a > b$ & $c > d$ then $a + c > \underline{b+d}$

Properties of Inequality

Addition POI if $a > b$ & $c > d$ then $a + c > b + d$

Properties of Inequality

Addition POI if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac >$

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

50 40

5 4 10 5·10 4·10

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$

if $a > b$ & $c < 0$ then $ac < bc$

5 3 -1

$5(-1)$ $3(-1)$

$-5 < -3$

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$

if $a > b$ & $c < 0$ then $ac < bc$

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$
if $a > b$ & $c < 0$ then $ac < bc$

Transitive POI

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$
if $a > b$ & $c < 0$ then $ac < bc$

Transitive POI — if $a > b$ & $b > c$ then

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$
if $a > b$ & $c < 0$ then $ac < bc$

Transitive POI — if $a > b$ & $b > c$ then $a > c$

Properties of Inequality

Addition POI — if $a > b$ & $c > d$ then $a + c > b + d$

Multiplication POI — if $a > b$ & $c > 0$ then $ac > bc$
if $a > b$ & $c < 0$ then $ac < bc$

Transitive POI — if $a > b$ & $b > c$ then $a > c$

Comparison POI

Properties of Inequality

Addition POI	if $a > b$ & $c > d$ then $a + c > b + d$
Multiplication POI	if $a > b$ & $c > 0$ then $ac > bc$ if $a > b$ & $c < 0$ then $ac < bc$
Transitive POI	if $a > b$ & $b > c$ then $a > c$
Comparison POI	if $a = b + c$ & $c > 0$ then $a >$

Properties of Inequality

Addition POI	if $a > b$ & $c > d$ then $a + c > b + d$
Multiplication POI	if $a > b$ & $c > 0$ then $ac > bc$ if $a > b$ & $c < 0$ then $ac < bc$
Transitive POI	if $a > b$ & $b > c$ then $a > c$
Comparison POI	if $a = b + c$ & $c > 0$ then $a > b$

$$\cancel{3} = 5 - \cancel{3x}$$
$$+3x \quad \cancel{-3} \qquad -3 \quad \cancel{+3x}$$
$$3x = 2$$
$$\frac{3x}{3} = \frac{2}{3}$$
$$x = 2/3$$

$$3 < 5 - 3x$$
$$+3x \quad -3 \qquad -3 \quad +3x$$
$$3x < 2$$
$$x < 2/3$$

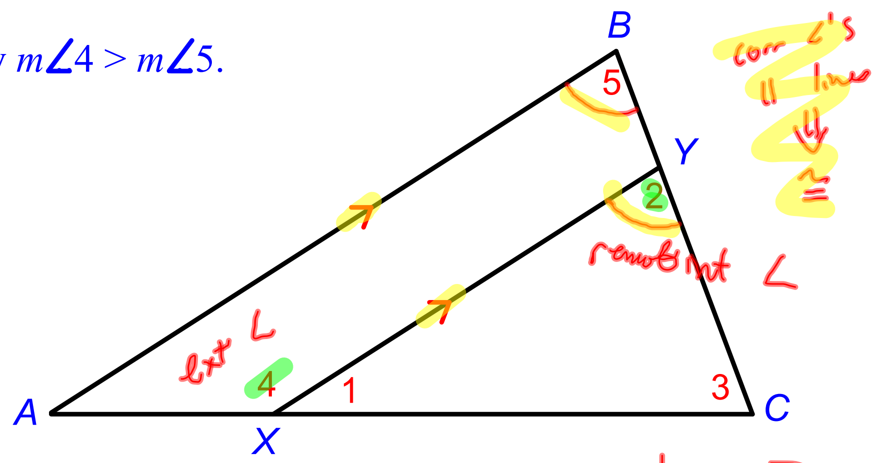
$$3 < 5 - 3x$$
$$-5 \qquad -5$$
$$\frac{-2}{-3} < \frac{-3x}{-3}$$
$$2/3 > x$$
$$x < 2/3$$

because you're really moving it to the other side

Flip the symbol if mult or div by neg

Example

Explain why $m\angle 4 > m\angle 5$.



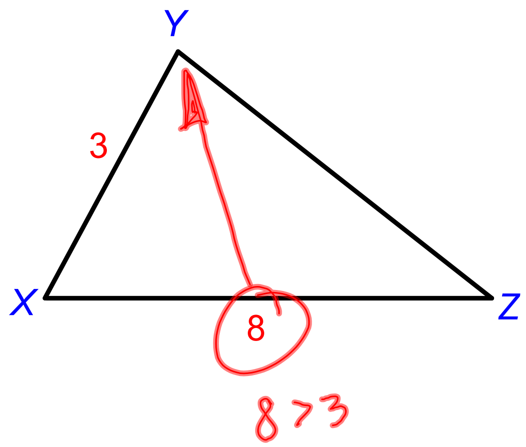
$m\angle 4 > m\angle 2$ because

ext $\angle$ > remote int $\angle$

So... $m\angle 4 > m\angle 5$ because $m\angle 4 > m\angle 2$ and $m\angle 2 = m\angle 5$

Form a conjecture for all triangles...

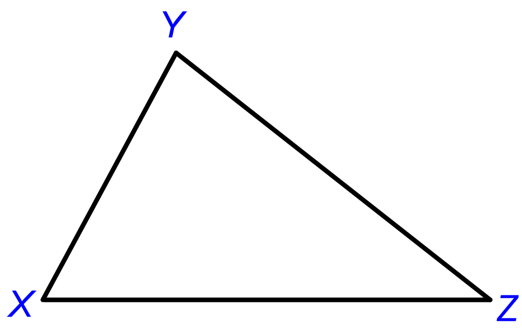
$m\angle Y$ > $m\angle Z$



Theorem 5-10

If 2 sides of a Δ are not $\cong$
then the larger $\angle$ lies opposite the longer side.

Largest $\angle$ is opp longest side

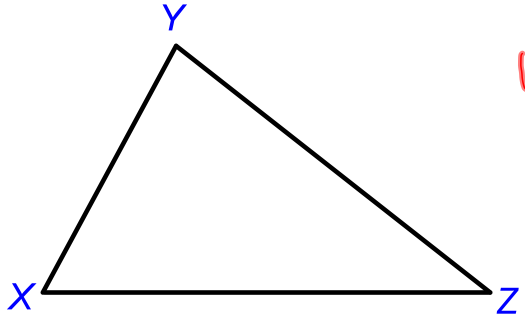


Given ΔXYZ, if $XZ > XY$ then $m\angle Y > m\angle Z$.

Theorem 5-11

If 2 ∠'s of a Δ are not ≅
then the longer side lies opposite the larger ∠.

Longest side is opp Largest ∠

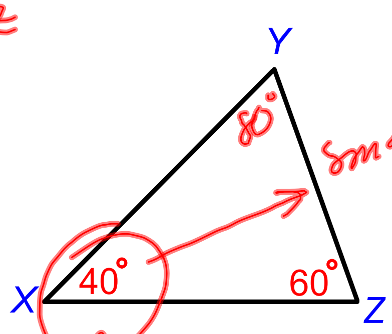


Given ΔXYZ, if $m\angle Y > m\angle Z$ then $XZ > XY$

Example

List the sides of ΔXYZ in order
from ***shortest*** to ***longest***. Explain.

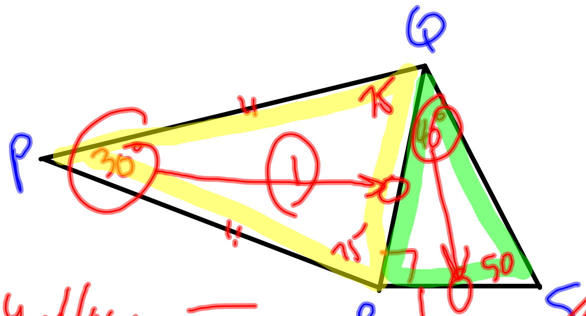
$\overline{YZ}$, $\overline{XY}$, $\overline{XZ}$



Smallest side

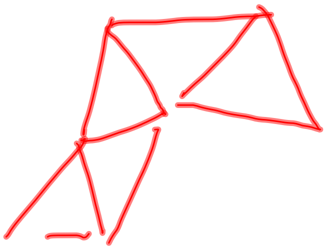
Smallest ∠

pg 278 #34   which seg is the shortest?



yellow: $\overline{QR}$

green: $\overline{RS}$



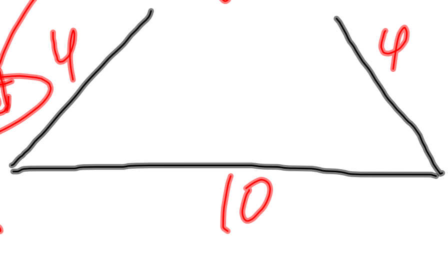
Could you form a Δ from:

4 cm, 4 cm, & 6 cm segments? yes

4 cm, 4 cm, & 10 cm segments? no

sides won't meet

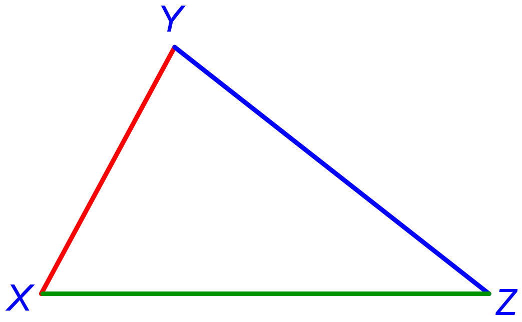
will have a gap of 2cm



Theorem 5-12: Triangle Inequality Thm

The sum of the lengths of any 2 sides of a Δ is greater than the length of the 3rd side.

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

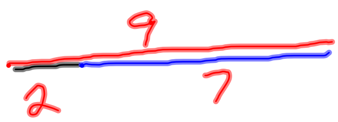


Example

Can a Δ have sides w/these lengths? NO

2 cm, 7 cm, & 9 cm

$\cancel{2+7=9}$



Example

Can a △ have sides w/these lengths?

4 yd, 6 yd, & 9 yd

yes

$4+6=10>9$

$4+9=13>6$

$6+9=15>4$

show all 3 !

Example

A △ has sides len 3in. and 12in.

Describe the lens possible for the 3rd side.

>9

<15

9.0001 14.9999

$9 < x < 15^-$

$12-3=9$ $3+12=15^-$

L5.5 HW Problems

Pg 272 #20-33
Pg 276 #1-27, 32,
34-37,
42-46