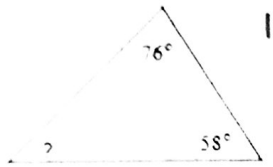
10.1: Triangle Basics

All angles in a triangle add up to 180°.

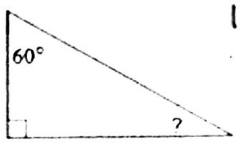
1. Find the measure of each missing angle.

a)



$180-76-58=\boxed{46^\circ}$

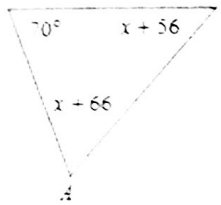
b)



$180-60-90=\boxed{30^\circ}$

2. Find $m\angle A$

a)



$70+x+56+x+66=180$

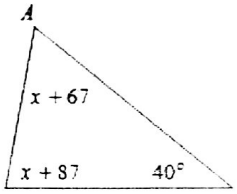
$2x+192=180$

$2x=-12$

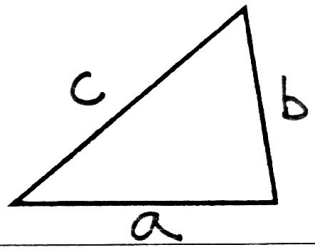
$x=-6$

$m\angle A=-6+66=\boxed{60^\circ}$

c)



Triangle Inequality Conjecture:	
If you add any two side lengths, the sum needs to be greater than the remaining side	$a+b>c$ $a+c>b$ $b+c>a$



3. State whether the given three numbers could be the measures of the sides of a triangle.

a) 4, 10, 12 — Yes

b) 12, 22, 8 — No — $12+8<22$

c) 10, 6, 17 — No — $10+6<17$

d) 11, 7, 19 — No — $11+7<19$

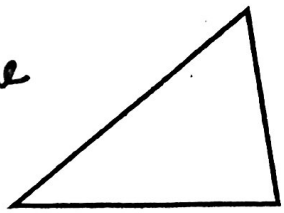
e) 9, 12, 3 — No — $9+3=12$

f) 4, 9, 6 — Yes

Side-Angle inequality Conjecture:

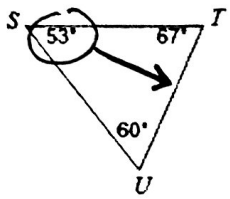
*The **SHORTEST** side of a triangle is always opposite the: smallest angle

*The **LONGEST** side of a triangle is always opposite the: largest angle



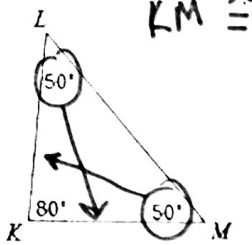
4. Order the sides of each triangle from shortest to longest:

a)



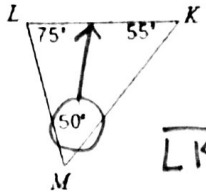
$\overline{UT}$, $\overline{ST}$, $\overline{SU}$

b)



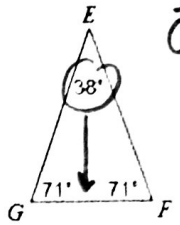
$\overline{KM} \cong LK, \overline{LM}$

c)



$\overline{LK}, \overline{LM}, \overline{KM}$

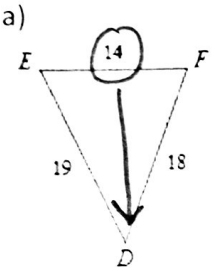
d)



$\overline{GF}, \overline{GE}, \overline{EF}$

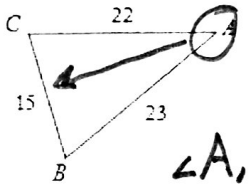
5. Order the angles in each triangle from smallest to largest.

a)



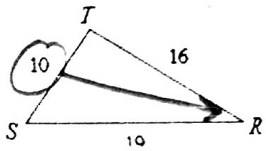
$\angle D, \angle E, \angle F$

b)

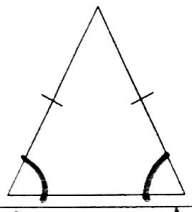
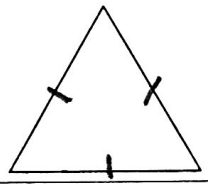


$\angle A, \angle B, \angle C$

c)



$\angle R, \angle S, \angle T$

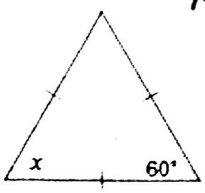
Isosceles Triangles	Equilateral Triangles
 Two sides are congruent Two angles are congruent	 All sides & angles are congruent (angles are 60°)

* The angle that is created from the two congruent sides is the one that is not the same as the other two

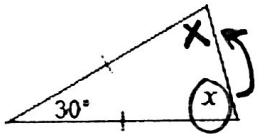
6. Use the properties of Equilateral and Isosceles Triangles to find the value of x in each triangle below:

a)

$x = 60$



b)

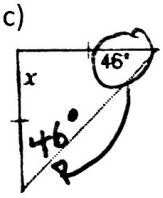


$30 + 2x = 180$

$2x = 150$

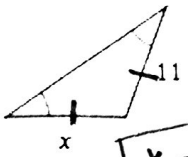
$\boxed{x = 75}$

c)



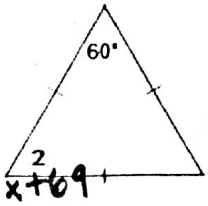
$180 - 46 - 46 = \boxed{88°}$

d)



$\boxed{x = 11}$

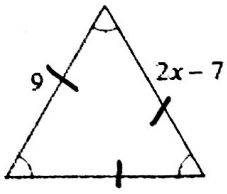
e) $m\angle 2 = x + 69$



$x + 69 = 60$

$\boxed{x = -9}$

f)



$2x - 7 = 9$

$2x = 16$

$\boxed{x = 8}$