

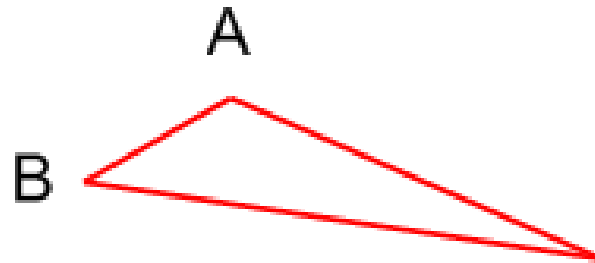
4.1

$$P = a + b + c$$

3 L's
3 sides

Naming a triangle:

$\triangle ABC$



$$A = \frac{1}{2}bh$$

C convex

What do we know about triangles?

a polygon

isosceles

angles add up to 180.

right (hypotenuse) obtuse

equilateral

equiangular


scalene

acute


pyramid - one side is a \triangle .

Classifying triangles by sides:

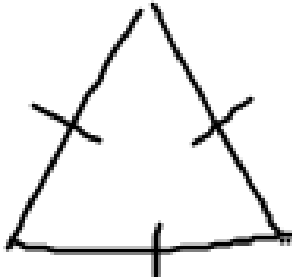
Scalene
Sides
are all
different



Isosceles
2 sides
equal



Equilateral
all sides are equal



Classifying triangles by angles:


Acute
angles $< 90^\circ$




Right
| right
angle



Obtuse
angle > 90



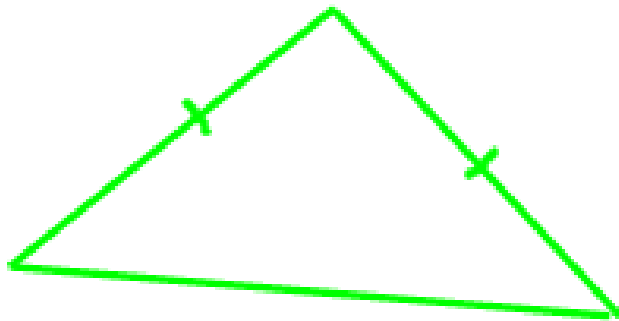
Equiangular
all \angle 's are equal



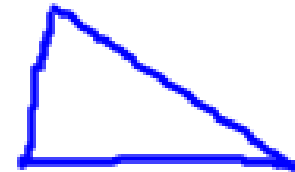
a. Draw an obtuse isosceles triangle.

b. Draw an acute scalene triangle.

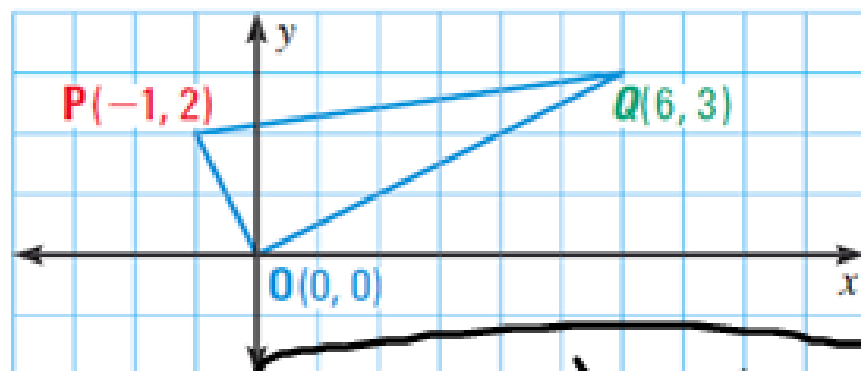
a.



b.



Classify $\triangle P Q O$ by its sides. Then determine if the triangle is a right triangle. yes



$$\begin{aligned}
 P O &= \sqrt{(-1-0)^2 + (2-0)^2} \\
 &= \sqrt{(-1)^2 + 2^2} \\
 &= \sqrt{1+4} = \sqrt{5}
 \end{aligned}$$

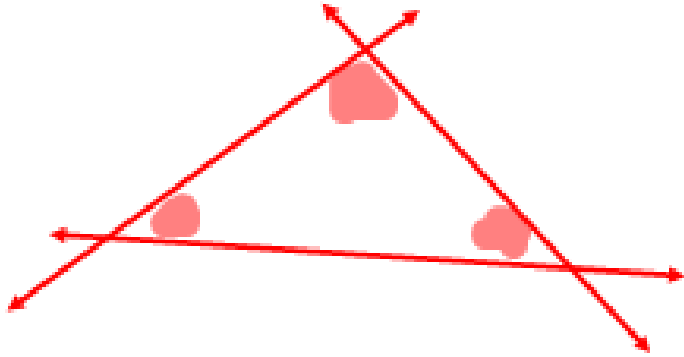
$$\begin{aligned}
 P Q &= \sqrt{(6+1)^2 + (3-2)^2} \\
 &= \sqrt{7^2 + 1^2} \\
 &= \sqrt{49+1}
 \end{aligned}$$

$$\begin{aligned}
 Q O &= \sqrt{(6-0)^2 + (3-0)^2} \\
 &= \sqrt{6^2 + 3^2} \\
 &= \sqrt{36+9} \\
 &= \sqrt{45}
 \end{aligned}$$

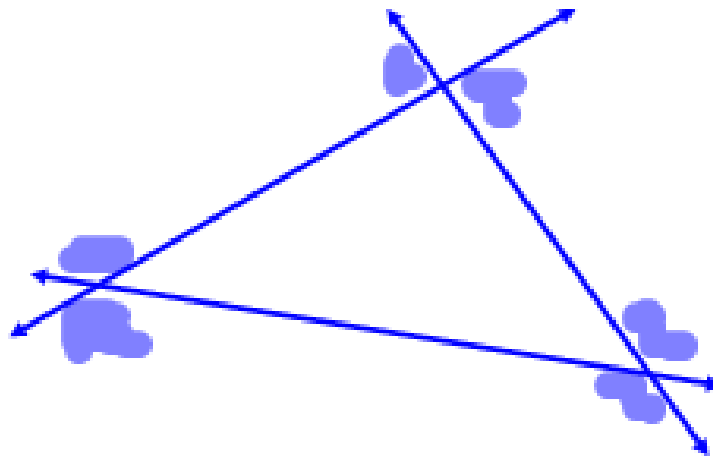
$P Q = \sqrt{50}$
Scalene

m of QO = $\frac{3}{6} = \frac{1}{2}$
 m of PO = $\frac{2}{-1} = -2$

Interior Angles

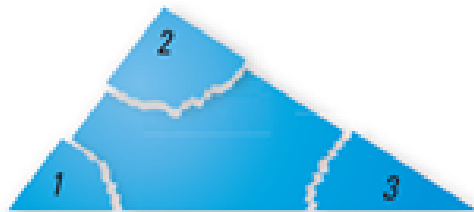


Exterior Angles



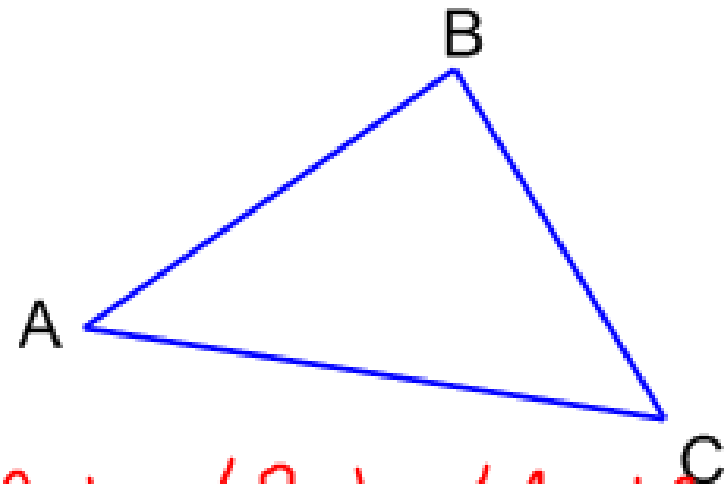
Distribute paper, scissors, and rulers.

Draw a triangle. Label the three angles 1, 2 and 3.
Tear off the 3 corners and place them next to each other.
What do we notice about the sum of the measures of the interior angles of a triangle?



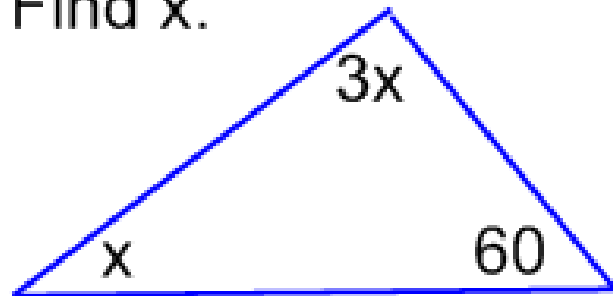
Triangle Sum Theorem

The sum of the measures of the interior angles of a triangle is 180.



$$m\angle A + m\angle B + m\angle C = 180.$$

Find x .



$$3x + x + 60 = 180$$

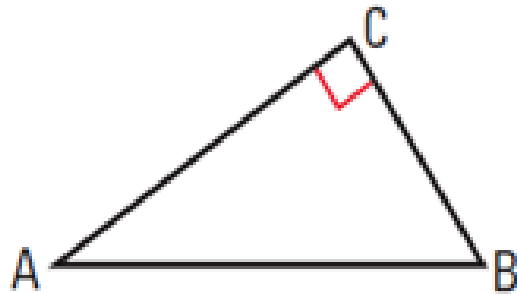
$$4x + 60 = 180$$

$$4x = 120$$

$$x = 30$$

Corollary to the Triangle Sum Thm

The acute angles of a right triangle are... *complementary.*



$$m\angle A + m\angle B = 90.$$

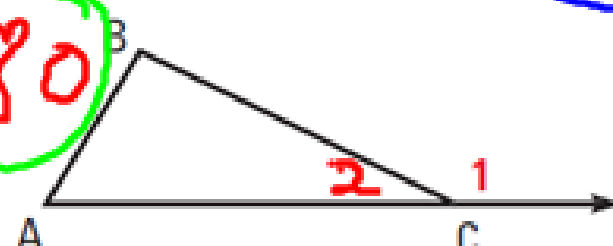
What is the relationship between angle A, angle B, and angle 1?

How could we describe the location of angles A & B if compared to angle 1?

$m\angle A + m\angle B + m\angle 2 = 180$ (circled)

$m\angle 1 + m\angle 2 = 180$ (circled)
(linear pair)

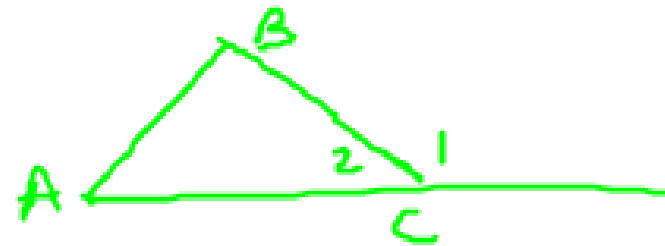
$m\angle A + m\angle B + \underline{m\angle 2} = \underline{m\angle 1 + m\angle 2}$



exterior.
Sum Thm

$$m\angle A + m\angle B = m\angle 1$$

Exterior Angle Thm

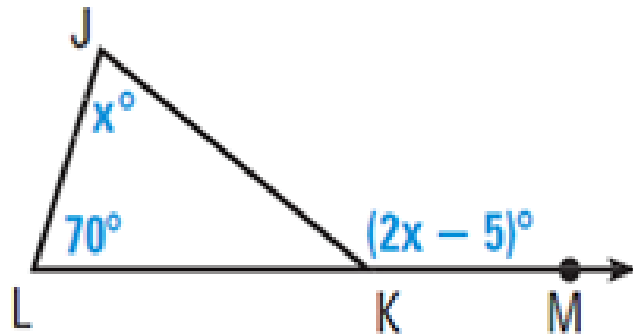


($\angle 1$)

$$m\angle A + m\angle B = m\angle 1$$

The measure of an exterior angle of a triangle is equal to the sum of the measures of the 2 nonadjacent interior angles. ($\angle A + \angle B$)

Find $m\angle JKM$.



$$70 + x = 2x - 5$$

$$-x \quad -x$$

$$70 = x - 5$$

$$75 = x$$

$$m\angle JKM = 2(75) - 5 = \boxed{145^\circ}$$

Homework:

p 221-223

#'s 1-7, 8-20 Even,

31, 32, 40, 42, 50

↑ proof of
Exterior
Angle
Thm.