Bellwork:

Write a given and prove statement:

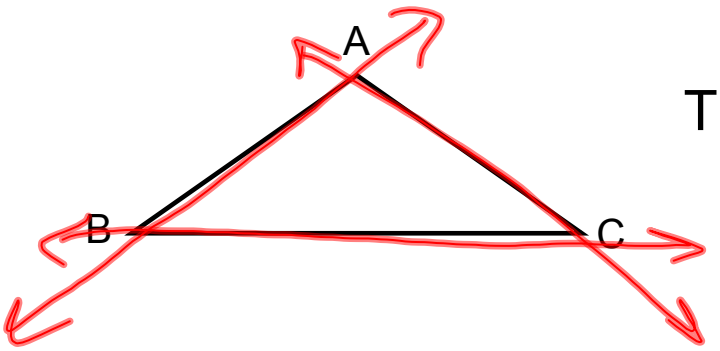
All squares have an interior angle sum of 360.

If given a square then the sum of the interior angles is 360°.

Given: Square ABCD
Prove: $m\angle 1 + m\angle 2 + m\angle 3 + m\angle 4 = 360$

Chapter 4.1: Applying Triangle Sum Properties

- A triangle is a polygon with three sides.

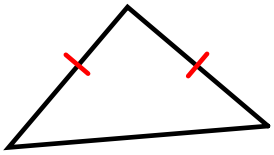


Triangle ABC

ΔABC

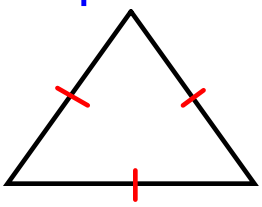
Classifying by sides:

Isosceles



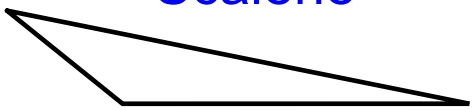
2 sides are equal or congruent because of the tick marks.

Equilateral



all sides same length

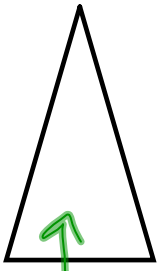
Scalene



means all sides are different lengths.

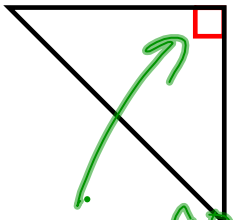
Classifying by Angles

Acute



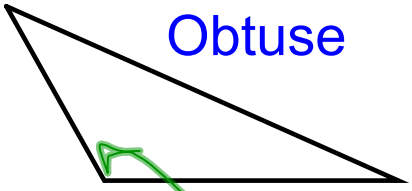
all angles are acute... little angles

Right



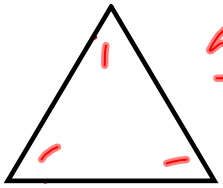
one 90° angle

Obtuse

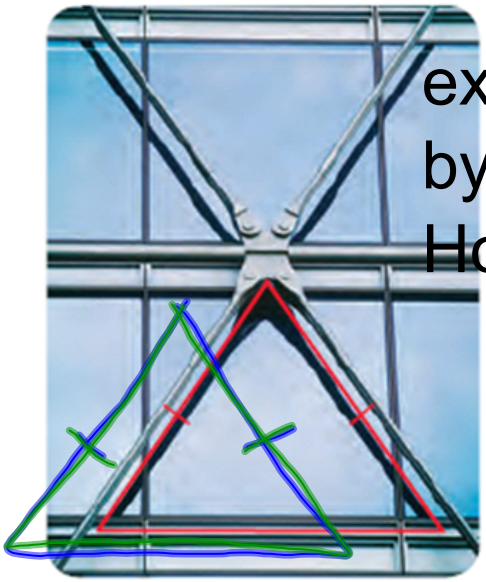


one angle Obtuse

Equiangular



same angle measures



ex. Classify the triangle by angles and sides. How do you know?

acute all angles $< 90^\circ$

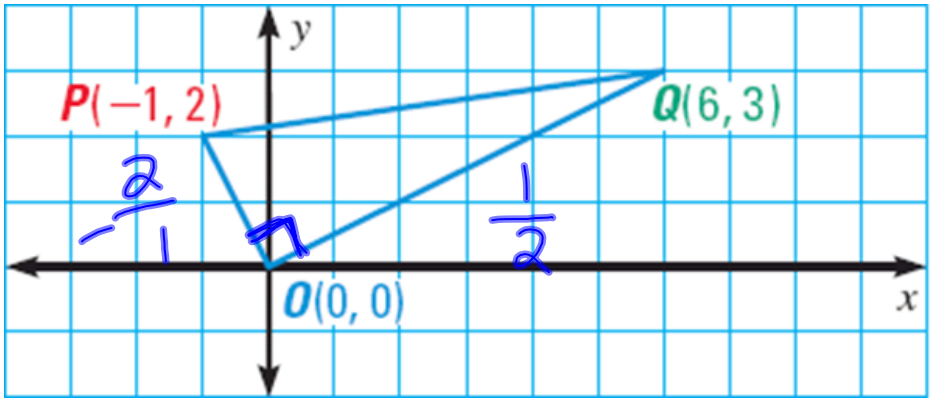
isosceles because 2 sides are =.

Midpoint : $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

★ Distance : $D=\sqrt{(x_1-x_2)^2+(y_1-y_2)^2}$

slope of perpendicular lines!

★ neg. rec. $2, -\frac{1}{2}$

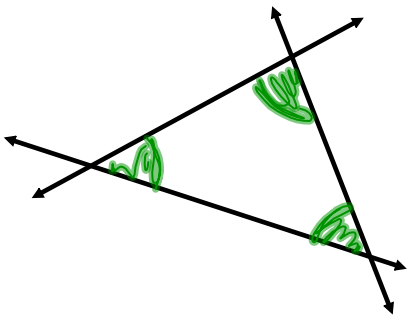


ex. Classify ΔPOQ by sides. Is it right? How do you know?

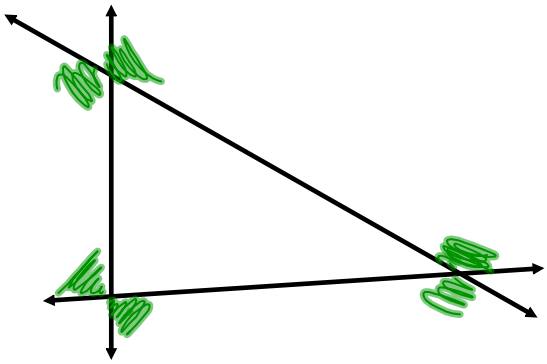
yes, perp. lines

scalene because all sides are diff.

Interior Angles



Exterior Angles



form Linear Pairs

Triangle Sum Theorem

Theorem 4.1: The sum of the measures of the interior angles of a triangle is 180.

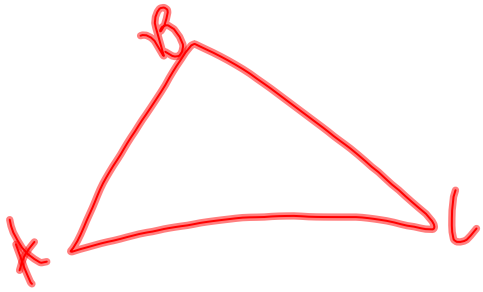
Proof???

WHY?????

Given: $\triangle ABC$

Prove: $\angle A + \angle B + \angle C = 180$

Picture



Exterior Angle Theorem

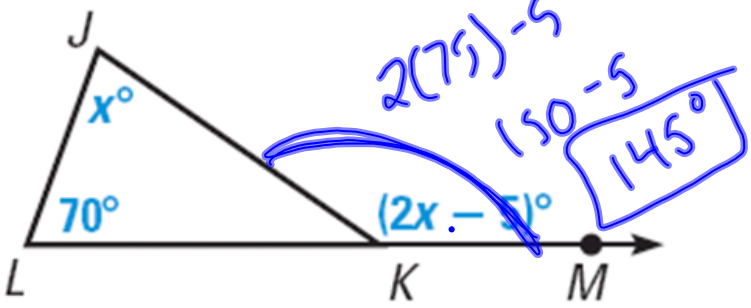
Theorem 4.2: The measure of an exterior angle of a triangle is equal to the sum of the two nonadjacent interior angles.

What????? WHY?????

Picture...

PROOF.....

ex. Find m<JKM



$70 + x = 2x - 5$

$-x \quad -x$

$70 = x - 5$

$+5 \quad +5$

$x = 75$

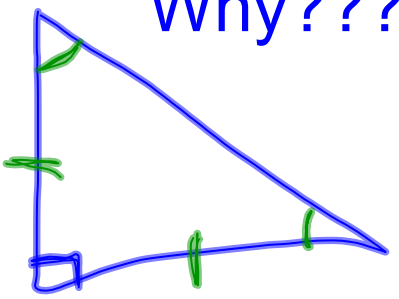
Corollary Triangle Sum Theorem:

The acute angles of a right triangle are complementary.

Corollary????

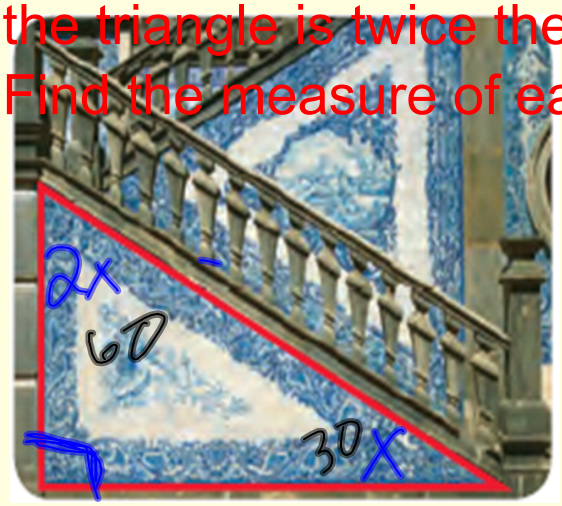
Proof????

Why?????



180
-90
90

ex. The tile staircase shown forms a right triangle. The measure of one acute angle in the triangle is twice the measure of the other. Find the measure of each acute angle.



$2x + x = 90$

$3x = 90$

$x = 30$

Homework: Chapter 4.1 pg.221 #'s 1-6,8,10,11,14-19,21-26,33