Geometry 4.1 * 6th grade standard

Identify and classify triangles by angle measures*

Identify and classify triangles by side measures*

acute $< 90°$

equiangular $3 \cong \angle s$

obtuse $90° - 180°$

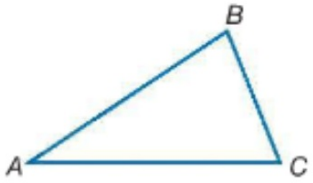
right $90°$

equilateral $3 \cong$ sides

isosceles $2 \cong$ sides

scalene 3 different sides

activity: triangle cutouts




The sides of $\triangle ABC$ are $\overline{AB}$, $\overline{BC}$, and $\overline{CA}$.

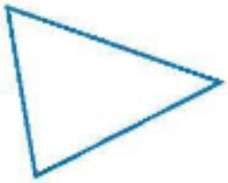
The vertices are points $A$, $B$, and $C$.

The angles are $\angle BAC$ or $\angle A$, $\angle ABC$ or $\angle B$, and $\angle BCA$ or $\angle C$.

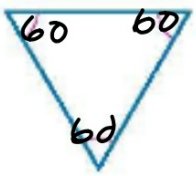
*When is it OK to say <A instead of <BAC?*

## KeyConcept Classifications of Triangles by Angles

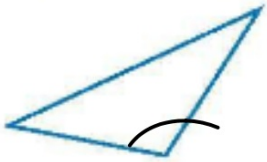
**acute triangle** ← **equiangular triangle** | **obtuse triangle** | **right triangle**



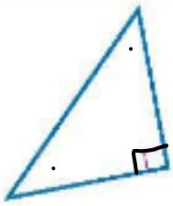
3 acute angles




3 congruent acute angles



1 obtuse angle



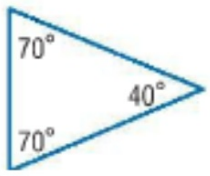
1 right angle

An equiangular triangle is a special kind of acute triangle.

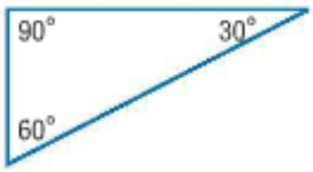
## Example 1 Classify Triangles by Angles

**Classify each triangle as *acute, equiangular, obtuse,* or *right*.**

**a.**

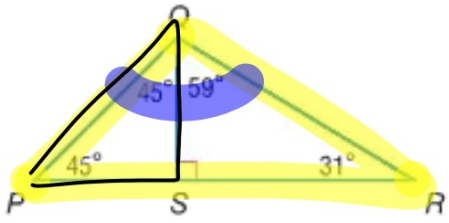



**b.**



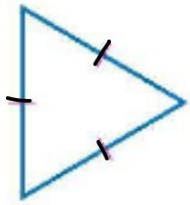
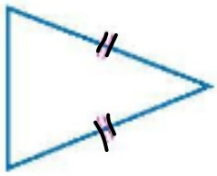
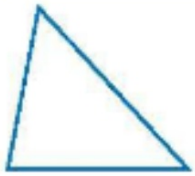
## Example 2 Classify Triangles by Angles Within Figures

**Classify $\triangle PQR$ as *acute, equiangular, obtuse,* or *right*. Explain your reasoning.**




**2.** Use the diagram to classify $\triangle PQS$ as *acute, equiangular, obtuse* or *right*. Explain your reasoning.

## KeyConcept Classifications of Triangles by Sides

| equilateral triangle | isosceles triangle | scalene triangle |
| --- | --- | --- |
|  |  |  |
| 3 congruent sides | ~~at least~~ 2 congruent sides | no congruent sides |

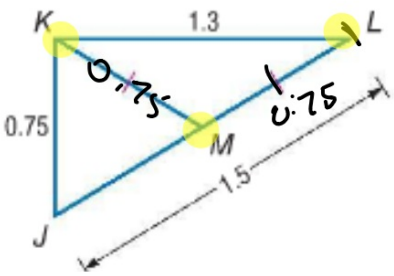
An equilateral triangle is a special kind of isosceles triangle.

Activity: triangle cutouts

take 2 that are different

## Example 4 Classify Triangles by Sides Within Figures

If point $M$ is the midpoint of $\overline{JL}$, classify $\triangle JKM$ as *equilateral*, *isosceles*, or *scalene*. Explain your reasoning.

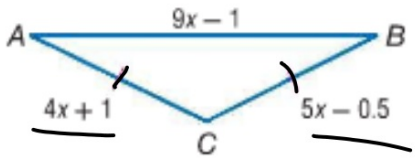



### GuidedPractice

**4.** Classify $\triangle KML$ as *equilateral*, *isosceles*, or *scalene*. Explain your reasoning.

## Example 5 Finding Missing Values

**ALGEBRA** Find the measures of the sides of isosceles triangle $ABC$.




$4x + 1 = 5x - 0.5$

$-4x + 0.5 \quad -4x + 0.5$

$1.5 = x$

$AB = 12.5$

$AC = 7$

$BC = 7$

$5y - 19 = 3y - 3$

$-3y + 19 \quad -3y + 19$

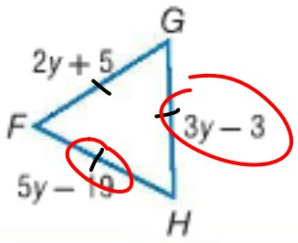
$2y = 16$

$y = 8$

$y = 11$

**GuidedPractice**

**5.** Find the measures of the sides of equilateral triangle $FGH$.




$FH = 21$ ~~36~~

$GH = 21$ ~~30~~

$FG = 21$