Geometry 4.1
Identify and classify triangles by angle measures*
Identify and classify triangles by side measures*
acute   all ∠s < 90
equiangular
obtuse 1 - obtuse   90 < a < 180
right   1 - 90°
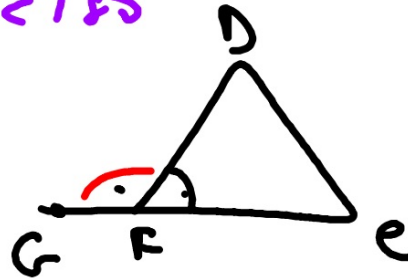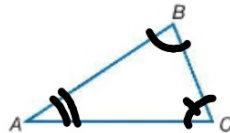equilateral 3 = sides
isosceles 2 = sides
scalene   all sides diff
activity: triangle cutouts

ΔABC

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

The vertices are points A, B, and C.

The angles are ∠BAC or ∠A, ∠ABC or ∠B, and ∠BCA or ∠C.

KeyConcept Classifications of Triangles by Angles
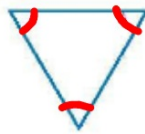
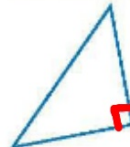| acute triangle	equiangular triangle	obtuse triangle	right triangle
3 acute angles	3 congruent acute angles	1 obtuse angle	1 right angle

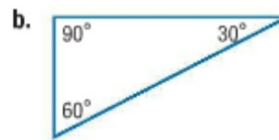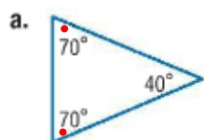An equiangular triangle is a special kind of acute triangle.

$$\frac{180}{3} = 60°$$

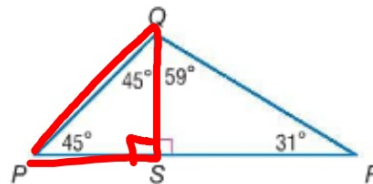**Example 1** Classify Triangles by Angles

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

a.

70°
40°
70°

b.

90°   30°
60°

Example 2 Classify Triangles by Angles Within Figures
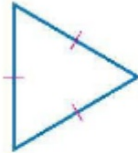
Classify △PQR as *acute, equiangular, obtuse,* or *right*. Explain your reasoning.

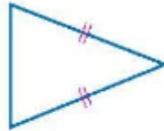2. Use the diagram to classify △PQS as *acute, equiangular, obtuse* or *right*. Explain your reasoning.

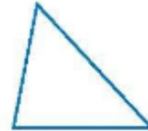**KeyConcept** Classifications of Triangles by Sides

equilateral triangle

isosceles triangle

scalene triangle

3 congruent sides

2 congruent sides

no congruent sides

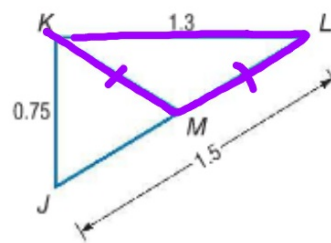An equilateral triangle is a special kind of isosceles triangle.

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.
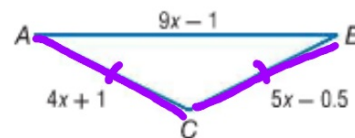

▸ **Guided**Practice

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

Example 5 Finding Missing Values

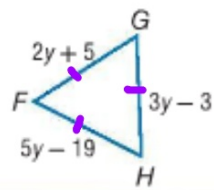**ALGEBRA** Find the measures of the sides of isosceles triangle *ABC*.

A ——— $9x - 1$ ——— B

$4x + 1$ ⋅ $5x - 0.5$

C

$AB = 12.5$
$BC = 7$
$AC = 7$

$4x + 1 = 5x - 0.5$
$-4x + 0.5 \quad -4x + 0.5$
$\overline{\quad\quad\quad\quad\quad\quad}$
$1.5 = x$

5. Find the measures of the sides of equilateral

G

2y + 5

F ⟨ ⟩ 3y − 3

5y − 19

H
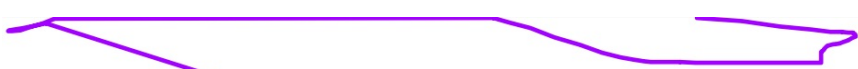
$FG = 21$

$GH = 21$

$HF = 21$

$5y - 19 = 3y - 3$

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

―――――――――

$2y = 16$

$y = 8$ 6

4.1   WB prac all
skills 11-14