CLASSIFYING TRIANGLES

4-2

1. Classify triangles by their angle measures and side lengths

2. Use triangle classifications to find angle measures and side lengths

OBJECTIVES

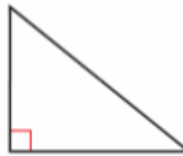# CLASSIFY BY ANGLES

Triangle Classification **By Angle Measures**
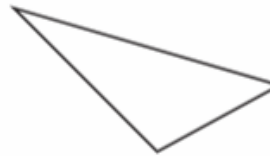
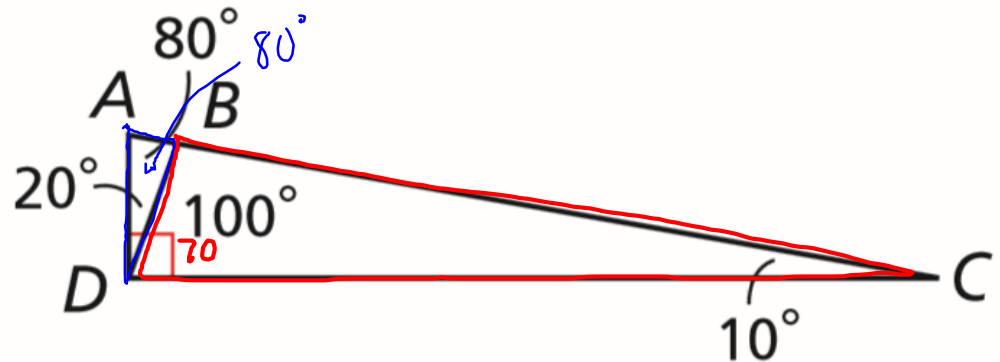| Acute Triangle	Equiangular Triangle	Right Triangle	Obtuse Triangle
Three acute angles	Three congruent acute angles	One right angle	One obtuse angle

Classify each triangle by its angle measures.

A. $\triangle ABD$: acute △
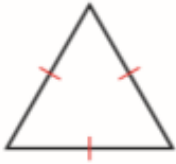
B. $\triangle BDC$: Obtuse △

C. $\triangle ACD$: right △

80° 80°

A B

20°

100° 70

D 10° C

CLASSIFY BY SIDES

Triangle Classification — **By Side Lengths**

Equilateral Triangle	Isosceles Triangle	Scalene Triangle
Three congruent sides	At least two congruent sides	No congruent sides

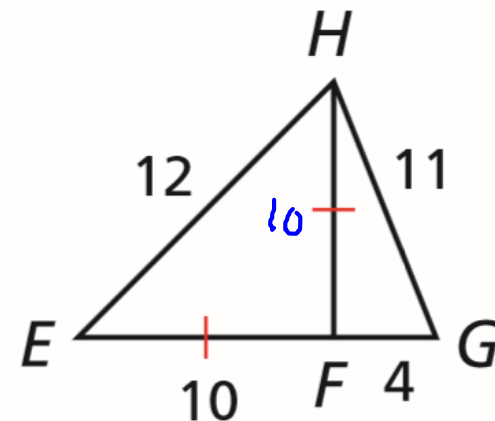A right triangle can be a classification by side lengths because of the Pythagorean Theorem.

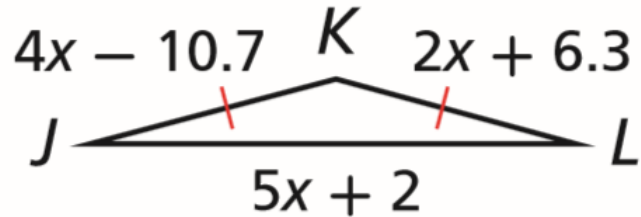Classify each triangle by its side lengths.

A. ΔEHF: Isosceles △

B. ΔEHG: Scalene △

C. ΔHFG: Scalene △

PRACTICE

1. Type equation here.Find the side lengths of the triangle.

$4x - 10.7$ K $2x + 6.3$

J ———————————— L

$5x + 2$

$4x - 10.7 = 2x + 6.3$
$2x = 17$
$x = 8.5$

$JK = KL = 23.3$ units
$JL = 44.5$ units

2. $\triangle ABC$ is equilateral. $AB = \left(\frac{1}{2}x + \frac{1}{4}\right)$, and $BC = \left(\frac{5}{2} - x\right)$. What is the perimeter of $\triangle ABC$?
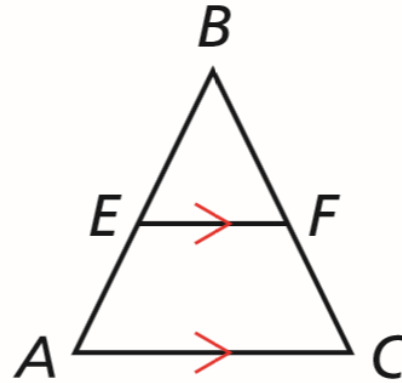
$AB = BC = AC = \frac{5}{2} - \frac{3}{2} = 1$

$P = 3$ units

$\frac{1}{2}x + \frac{1}{4} = \frac{5}{2} - x$
$2x + 1 = 10 - 4x$
$6x = 9$
$x = \frac{3}{2}$

Given: $\triangle ABC$ is equiangular

$\overline{EF} \parallel \overline{AC}$
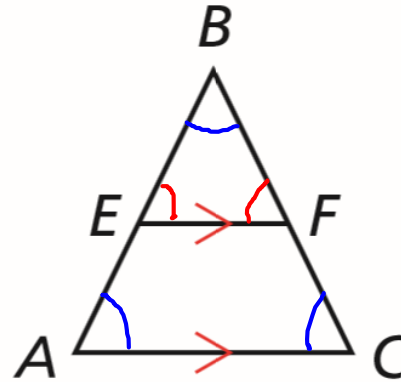
Prove: $\triangle EBF$ is equiangular

Statements	Reasons

CHALLENGE

Given: $\triangle ABC$ is equiangular

$\overline{EF} \parallel \overline{AC}$

Prove: $\triangle EBF$ is equiangular

Statements	Reasons
$\triangle ABC$ is equiangular	Given
$\angle A \cong \angle B \cong \angle C$	Definition of equiangular
$\overline{EF} \parallel \overline{AC}$	Given
$\angle BEF \cong \angle A$; $\angle BFE \cong \angle C$	Corresponding Angles Postulate
$\angle BEF \cong \angle B \cong \angle BFE$	Substitution Property (steps 2,4)
$\triangle EBF$ is equiangular	Definition of equiangular

CHALLENGE

Angles can be classified by their angles (acute, right, obtuse, equiangular)

Angles can be classified by their sides (scalene, isosceles, equilateral, right)

SUMMARY

LEARNING RUBRIC

▶ Got It: To formally or informally prove classifications of triangles

▶ Almost There: To find angle measures and side lengths in real world/complex situations

▶ Moving Forward: To find angle measures and side lengths given triangle classification

▶ Getting Started: To classify angles by given angle measures or side lengths

Pages 227 – 229
12 – 18 even;
30,32,35,36,37,40,42,44

HOMEWORK