

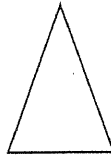
HW: p. 219-220, #1-32
Classifying Triangles

Definition: A Triangle is a polygon with three sides. Angles sum to... 180°.

Classification: Triangles can be classified by their **angle measures** or by their **side lengths**.

1. Triangle Classification by Angle Measure

a. **Acute Triangle:**

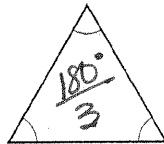


ACUTE TRIANGLE QUESTIONS
How many angles must be acute? all 3
What do the angles have to measure? must be less than 90°

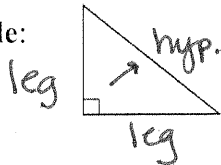
b. **Equiangular Triangle:**

EQUIANGULAR TRIANGLE QUESTIONS

What do all of the angles have to measure? 60°



c. **Right Triangle:**



RIGHT TRIANGLE QUESTIONS

Could you have more than one right angle? NO!

What do we call the sides that form the right angle? Legs

What is the name for the side opposite the right angle? Hypotenuse

How would you classify the angles that are not right angles? What angle relationship would they have?

acute & complementary

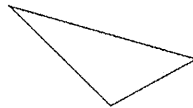
What is the famous theorem associated with right triangles? Pythagorean Thm

$$a^2 + b^2 = c^2$$

d. **Obtuse Triangle:**

OBTUSE TRIANGLE QUESTIONS

Could you have more than one obtuse angle? No!

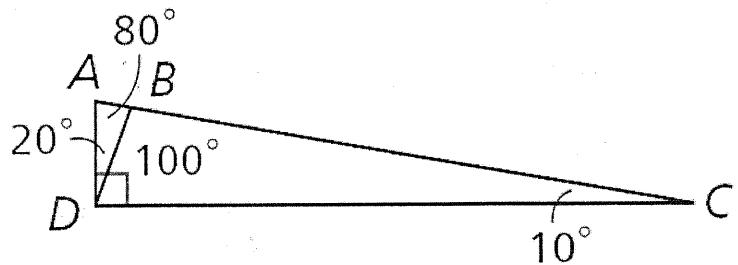


Example: Classify each triangle by its angle measures.

a. $\triangle ADC$... Rt. Triangle

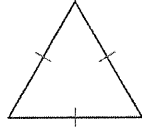
b. $\triangle ABD$... Acute Triangle

c. $\triangle BDC$... Obtuse Triangle

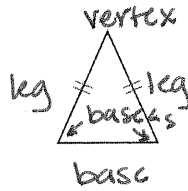


2. Triangle Classification by Side Length

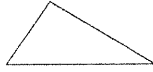
a. **Equilateral Triangle:** Three congruent sides



b. **Isosceles Triangle:** At least two congruent sides



c. **Scalene Triangle:** No congruent sides



ISOSCELES TRIANGLE QUESTIONS

How many congruent sides must an isosceles triangle have? at least 2

What are the congruent sides of an isosceles triangle called? legs

What is the name of the angle formed by the legs of an isosceles triangle? vertex

What is the name of the side opposite the vertex angle? Base

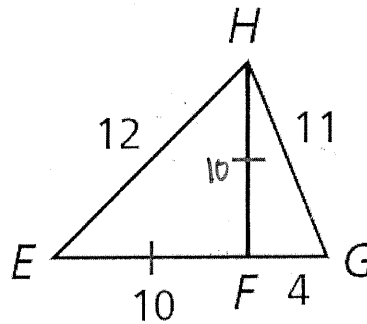
What is the name for the angles formed by the base of the triangle? Base angles

Example: Classify each triangle by its side lengths.

1. $\triangle HGF$ scalene Triangle

2. $\triangle HFE$ isosceles Triangle

3. $\triangle HGE$ scalene Triangle



****NOTE**** When we classify triangles, we classify by side length first, and then by angles.

Tell whether the following are TRUE or FALSE?

1. If a triangle is isosceles, then it is equilateral. F

2. If a triangle is acute, then it has at least one acute angle. T

3. A right triangle must have a right angle, and the other angles must be obtuse. F
acute

4. It is possible that a triangle may have two obtuse angles and one acute angle. F

5. The longest side of a triangle is opposite the greatest angle. T

6. If a triangle is equilateral, then it is isosceles. T

7. A triangle can be scalene and acute. T

8. The angles of a triangle must sum to 360 degrees. F
180°

9. The longest side of a right triangle is called the hypotenuse. T

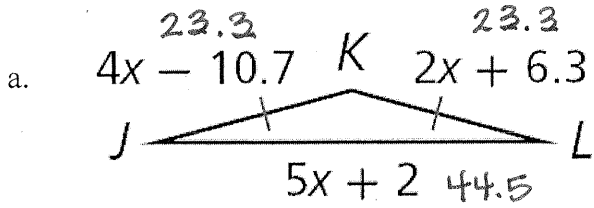
10. If two sides of a triangle are congruent, then the angles opposite those sides are congruent. T

could you have an isosceles right triangle? if so, what would the angles measure? 45°-45°-90°

II. Using Triangle Classification

Example:

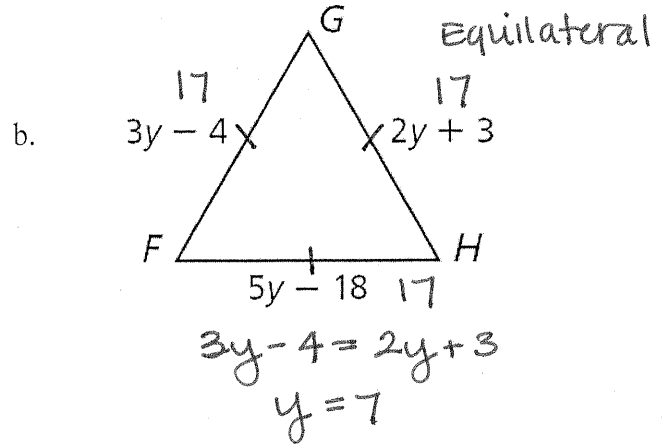
1. Find the side lengths of the triangle. *isosceles*



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

$$\frac{2x}{2} = \frac{17}{2}$$

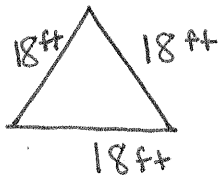
$$x = 8.5$$



$$3y - 4 = 2y + 3$$

$$y = 7$$

2. A steel mill produces roof supports by welding pieces of steel beams into equilateral triangles. Each side of the triangle is 18 feet long. How many triangles can be formed from 420 feet of steel beam?



$$\frac{420}{54} = 7.78$$

only 7 can be made!

⇓
54 ft/beam

