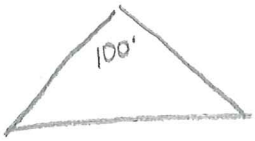
Section 4.1 & 4.2 Triangle Basics

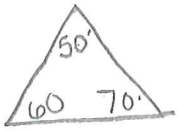
A triangle can be classified by its Sides **and** Angles.

Angle Classification:

Right



obtuse



acute

Side Classification:

Scalene

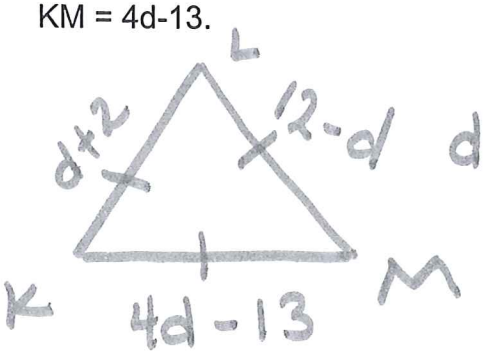
Base ∠s are ≅

isosceles

all ∠s are 60°

equilateral

Example 1: Find d and the measure of each side of equilateral triangle KLM KL = d+2, LM = 12-d, and KM = 4d-13.



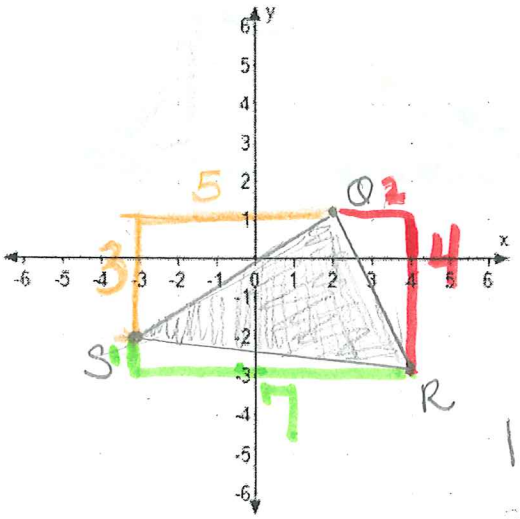
$KL = LM$ def of equilateral △

$d+2 = 12-d$

$\boxed{d = 5}$

$KL = 7$
$LM = 7$
$KM = 7$

Example 2: Find the measures of the sides of triangle QRS with Q(2,1) R(4,-3) and S(-3,-2). Classify the triangle.



$SQ = \sqrt{3^2+5^2} = \boxed{\sqrt{34}}$

$QR = \sqrt{2^2+4^2} = \sqrt{20} = \boxed{2\sqrt{5}}$

$SR = \sqrt{1^2+7^2} = \sqrt{50} = \boxed{5\sqrt{2}}$

Scalene

Is Q a right angle? No...

Why?

Check if slopes are ⊥

Slope SQ: $\frac{3}{5}$

Slope QR: $-\frac{4}{2} = -2$

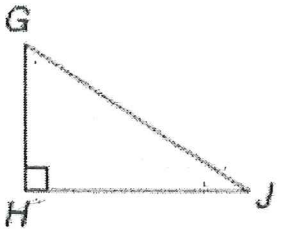
NOT ⊥

The Triangle Sum Theorem states

the interior angles of a triangle add to = 180°

Corollary: The angles of a right triangle are complementary.

Proof:



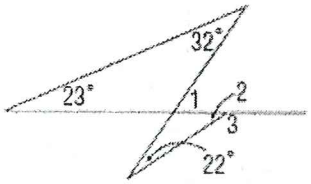
Given: ΔGHJ is a right triangle.

Prove: $\angle G + \angle H = 90$

$\angle J$

1. ΔGHJ is a RT Δ	1. given
2. $\angle H = 90°$	2. def of Right Δ
3. $\angle G + \angle J + \angle H = 180°$	3. Δ sum thm.
4. $\angle G + \angle J + 90 = 180$	4. substitution
5. $\angle G + \angle J = 90$	5. Subtraction

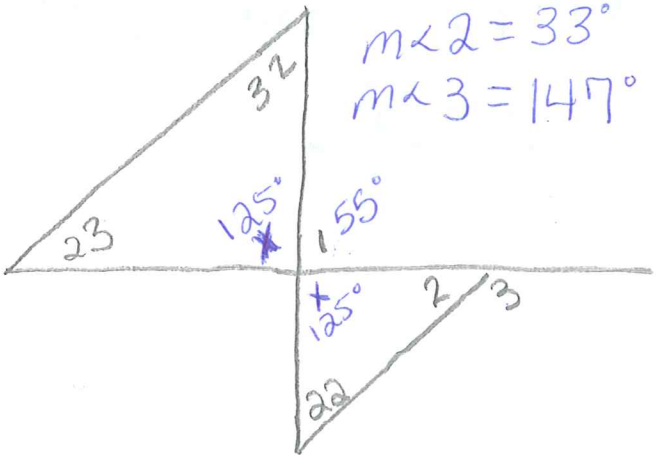
Example 3: Find each missing measure.



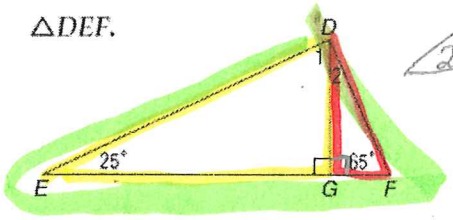
$m\angle 1 = 55°$

$m\angle 2 = 33°$

$m\angle 3 = 147°$



Example 4: Find each missing measure.



$m\angle 1 = 65°$

$m\angle 2 = 25$