Name _____ Date _____

A triangle is a 3-sided polygon. It is made up of segments called Sides, that intersect at endpoints called Vertices. The interior angles of a triangle sum up to 180.

CLASSIFY BY ANGLES

Acute Triangle	Obtuse Triangle	Right Triangle	Equiangular Triangle
3 angles are acute.	1 angle is obtuse. The other two angles must be Acute.	1 angle is right. The other two angles must be Acute and are Complementary.	3 angles are congruent. Equiangular triangles are Acute triangles.

CLASSIFY BY SIDES

Scalene Triangle	Isosceles Triangle	Equilateral Triangle
All sides have Different lengths.	At least 2 sides are congruent.	3 sides are congruent. This is a special kind of Isosceles triangle.

ANGLE/SIDE RELATIONSHIPS

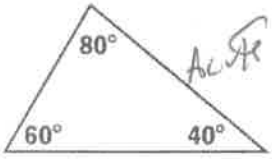
If a triangle has 3 angles congruent, it has 3 sides congruent.

If a triangle has 2 angles congruent, it has 2 sides congruent.

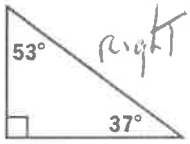
If a triangle has 0 angles congruent, it has 0 sides congruent.

EXAMPLES

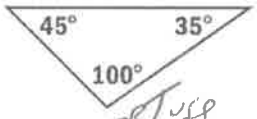
Classify the triangle by its angle measures.

1) 

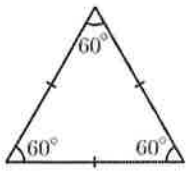
Acute

2) 

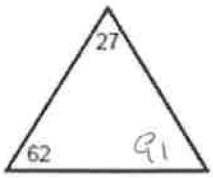
Right

3) 

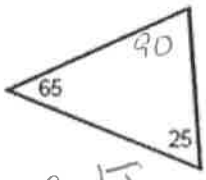
obtuse

4) 

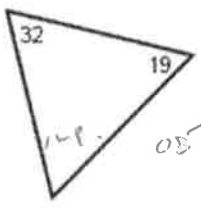
equiangular

5) 

obtuse

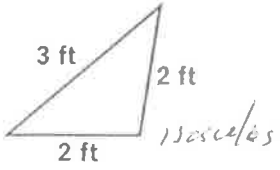
6) 

Right

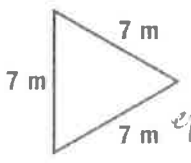
7) 

obtuse

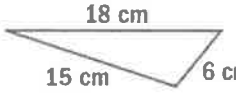
Classify the triangle by lengths of its sides.

8) 

Isosceles

9) 

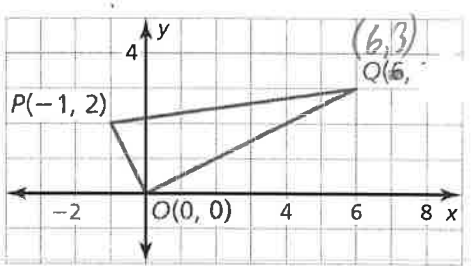
equilateral

10) 

Scalene

TRIANGLES IN THE COORDINATE PLANE

11) Classify ΔPQO by its sides. Then determine whether it is a right triangle.



$PO = \sqrt{5}$

$OQ = \sqrt{45}$ scalene

$PQ = \sqrt{50}$

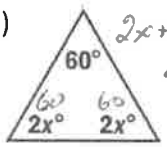
$PO_m = \frac{-2}{1} = -2$ Right

$\perp$

$OQ_m = \frac{3}{6} = \frac{1}{2}$

Find the value of x. Then classify the triangle.

12)



$2x+2x+60 = 180$

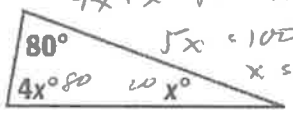
$4x = 120$

$x = 30$

equiangular

equilateral

13)



$4x+x+80 = 180$

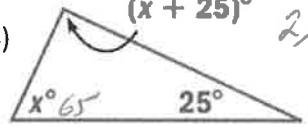
$5x = 100$

$x = 20$

ACUTE

isosceles

14)



$x+x+25+25 = 180$

$2x = 130$

$x = 65$

Right

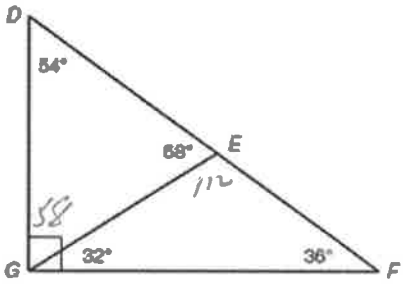
Scalene

Use the figure to the right to answer the following:

15) Classify ΔDEG Acute scalene

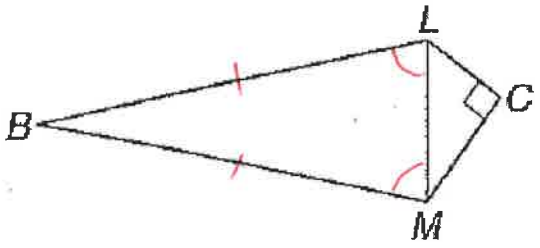
16) Classify ΔGEF OBTUSE scalene

17) Classify ΔDGF Right scalene



Name _____ Date _____

1) Use the figure to the right to answer the following:



Identify an acute triangle. △BLM

Name the hypotenuse. $\overline{LM}$

Name the vertex angle. ∠LBM

Name the side opposite ∠C. $\overline{LM}$

Name the angle opposite $\overline{MB}$. ∠BLM

Name the base angles. ∠BLM + ∠BML

Name the vertices of the right triangle. L, C, M

Name the legs of the isosceles triangle. $\overline{BL}$ + $\overline{BM}$

△BLM is isosceles with base $\overline{ML}$.

2) △*BCD* is isosceles with ∠*C* as the vertex angle. Find *x* and the measure of each side if $BC = 2x + 4$, $BD = x + 2$, and $CD = 10$. (*Hint:* Draw a diagram.)

$2x + 4 = 10$

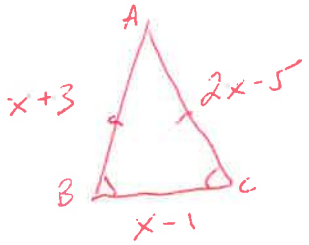
$x = 3$

CD = 10 BC = 10 BD = 5

3) △*HKT* is equilateral. Find *x* and the measure of each side if $HK = x + 7$ and $HT = 4x - 8$.

$x + 7 = 4x - 8$ $15 = 3x$ $5 = x$ All sides = 12

4) △*ABC* is isosceles with ∠*A* as the vertex angle. *AC* is five less than two times a number. *AB* is three more than the number. *BC* is one less than the number. Find the measure of each side.



AB = 11 AC = 11 BC = 7

$x + 3 = 2x - 5$

$8 = x$

5) For each sentence, fill in the blank with Always, Sometimes, Never.

Equilateral triangles are ? isosceles. Always

Scalene triangles are ? isosceles. ~~Sometimes~~ Never

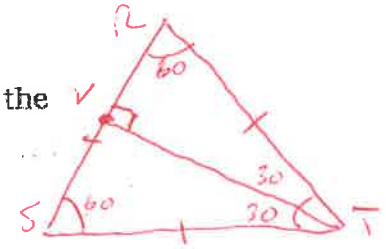
Right triangles are ? acute. Never

Acute triangles are ? equilateral. Sometimes

Obtuse triangles are ? scalene. Sometimes

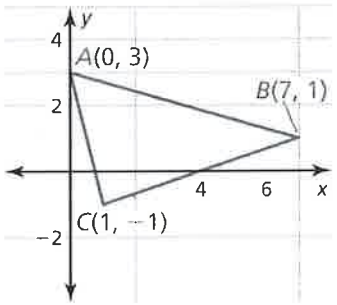
Equiangular triangles are ? acute. Always

6) △*RST* is equilateral, and *V* lies on $\overline{RS}$ so that $\overline{TV} \perp \overline{RS}$. Classify △*TVS* by the measures of its angles and its sides.



Right Scalene

7) Classify Δ*ABC* by its sides. Then determine whether it is a right triangle.



$AC = \sqrt{17}$

$CB = \sqrt{40}$

$AB = \sqrt{53}$

Scalene

$AC_m = \frac{-1-3}{1-0} = \frac{-4}{1} = -4$ NOT ⊥

$CB_m = \frac{-1-1}{1-7} = \frac{-2}{-6} = \frac{1}{3}$ NOT NOT △