NAME: _____ DATE: _____ PERIOD: 1 2 5 7 8 9

CHAPTER 4 NOTES: SECTION 1 CLASSIFYING TRIANGLES

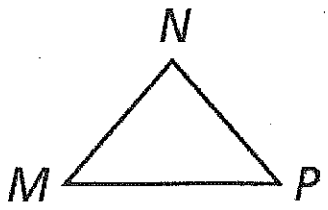
A _____ is a closed figure in a plane made up of segments called sides that intersect only at their endpoints called vertices. These intersections create angles. A _____ is a three sided polygon.

A triangle has three parts:

Sides: _____

Vertices: _____

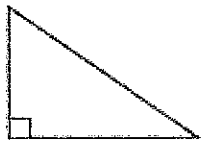
Angles: _____



Triangles can be classified in two ways: by their _____ and by their _____.

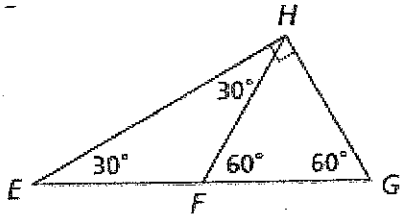
★ Equal number of angle marks indicate congruent angle measures.

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

- If ***ALL THREE*** of the angles of a triangle are acute angles, then the triangle is an ***ACUTE TRIANGLE.***
- If ***ALL THREE ANGLES*** of an acute triangle are congruent, the the triangle is an ***EQUIANGULAR TRIANGLE.***
- If ***ONE*** of the angles of a triangle is a right angle, then the triangle is a ***RIGHT TRIANGLE.***
  - A right triangle has two legs that form the right angle and the side opposite the right angle is called the hypotenuse.
- If ***ONE*** of the angles of a triangle is an obtuse angle, then the triangle is an ***OBTUSE TRIANGLE.***

PRACTICE: Classify each triangle in the picture below.



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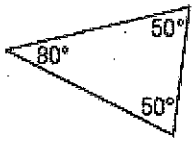
4.



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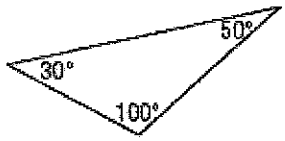

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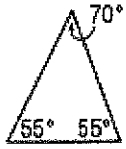
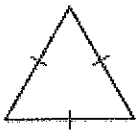
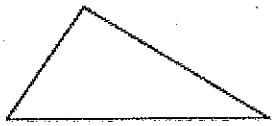


★ Equal numbers of hash marks indicate congruent sides.

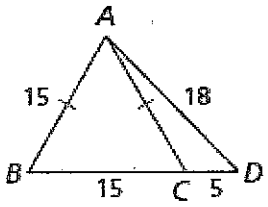
Triangle classification **By Side Lengths**

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

★ An equilateral triangle is a special type of isosceles triangle

- ❖ If ***ALL THREE*** sides of a triangle are congruent, then the triangle is an ***EQUILATERAL TRIANGLE.***
- ❖ If ***AT LEAST TWO*** sides of a triangle are congruent, then the triangle is an ***ISOSCELES TRIANGLE.***
  - An isosceles triangle consists of a two congruent legs and a base. The angle formed by the intersecting legs is called the vertex. The angles formed by the congruent sides and the base, are called the base angles. The base angles are congruent in measure.
- ❖ If ***NO TWO*** sides of a triangle are congruent, then the triangle is a ***SCALENE TRIANGLE.***

PRACTICE: Classify each triangle by its side lengths.



Find the measure of each side of isosceles $\triangle ABC$ with $AB = BC$ if $AB = 4y$, $BC = 3y + 2$, and $AC = 3y$.

Find the measure of each side of $\triangle ABC$ with vertices $A(-1, 5)$, $B(6, 1)$, and $C(2, -6)$. Classify the triangle.

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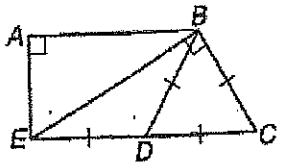
MORE PRACTICE:

Identify the indicated type of triangles.



7. right

8. isosceles

9. scalene

10. obtuse

ALGEBRA Find x and the measure of each side of the triangle.

11. $\triangle ABC$ is equilateral with $AB = 3x - 2$, $BC = 2x + 4$, and $CA = x + 10$.

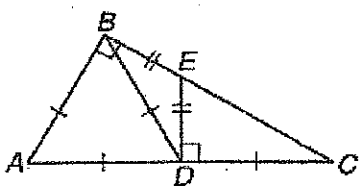
12. $\triangle DEF$ is isosceles, $\angle D$ is the vertex angle, $DE = x + 7$, $DF = 3x - 1$, and $EF = 2x + 5$.

Find the measures of the sides of $\triangle RST$ and classify each triangle by its sides.

13. $R(0, 2)$, $S(2, 5)$, $T(4, 2)$

14. $R(1, 3)$, $S(4, 7)$, $T(5, 4)$

Identify the indicated type of triangles if $\overline{AB} \cong \overline{AD} \cong \overline{BD} \cong \overline{DC}$, $\overline{BE} \cong \overline{ED}$, $\overline{AB} \perp \overline{BC}$, and $\overline{ED} \perp \overline{DC}$.



4. right

5. obtuse

6. scalene

7. isosceles

ALGEBRA Find x and the measure of each side of the triangle.

8. $\triangle FGH$ is equilateral with $FG = x + 5$, $GH = 3x - 9$, and $FH = 2x - 2$.

9. $\triangle LMN$ is isosceles, $\angle L$ is the vertex angle, $LM = 3x - 2$, $LN = 2x + 1$, and $MN = 5x - 2$.

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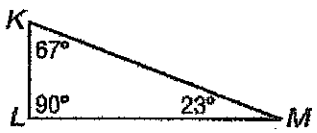
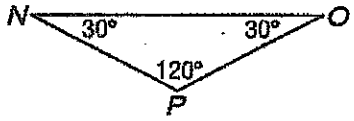
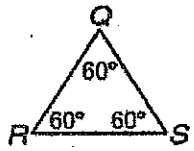
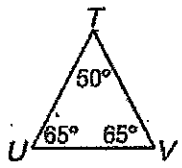
HW #9: Classifying Triangles

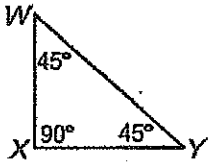
Classify each triangle as *acute*, *equiangular*, *obtuse*, or *right*.

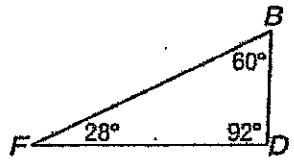
1. 

2. 

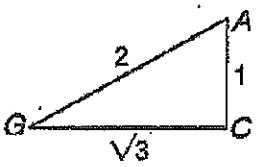
3. 

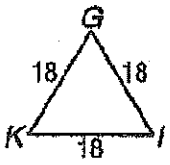
4. 

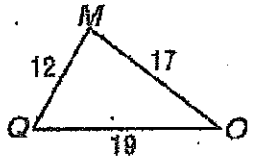
5. 

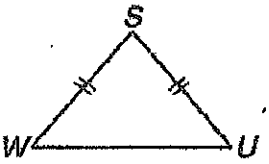
6. 

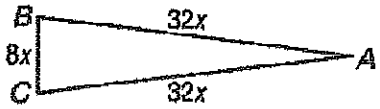
Classify each triangle as *equilateral*, *isosceles*, or *scalene*.

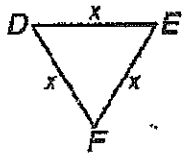
1. 

2. 

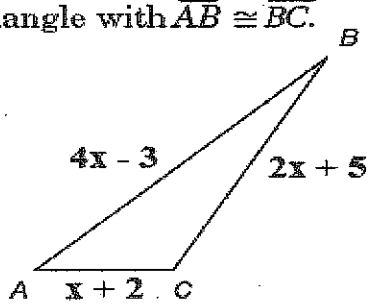
3. 

4. 

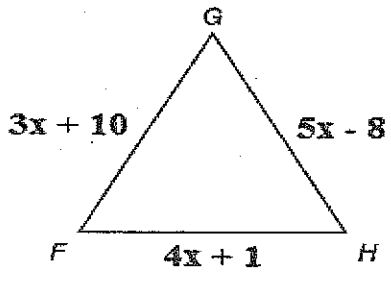
5. 

6. 

7. **ALGEBRA** Find x and the length of each side if $\triangle ABC$ is an isosceles triangle with $\overline{AB} \cong \overline{BC}$.



8. **ALGEBRA** Find x and the length of each side if $\triangle FGH$ is an equilateral triangle.



Find the measures of the sides of $\triangle KPL$ and classify each triangle by its sides.

10. $K(-3, 2)$ $P(2, 1)$, $L(-2, -3)$