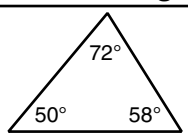
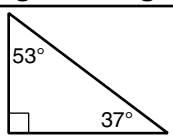
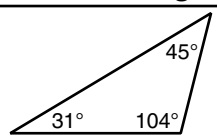
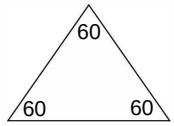
# Classifying Triangles by Angles and Sides

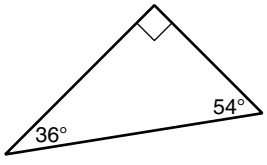
Name: _____

Geometry

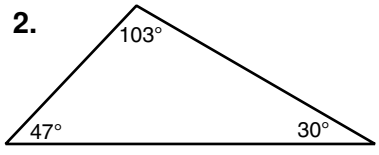
**LESSON 4-1**

| Acute Triangle | Right Triangle | Obtuse Triangle | Equiangular Tri. |
|---|---|---|---|
|   |   |   |   |
| all acute angles | one right angle | one obtuse angle | all angles ≅ |

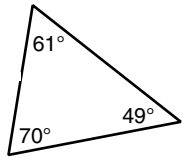
**Classify each triangle by its angle measures. Remember, there are 180° in every triangle.**

**1.**  

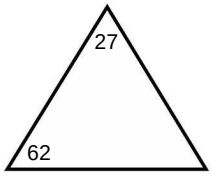
*Classify:*_____

**2.**  

*Classify:* _____

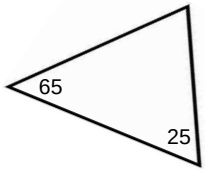
**3.**  

*Classify:*_____

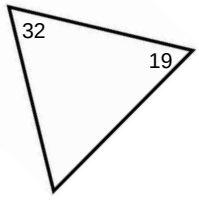
*third angle =* _____

*Classify:*_____

*third angle =* _____

*Classify:* _____

*third angle =* _____

*Classify:*_____

**Use the figure to classify each triangle by its angle measures.**

**4.** △*DFG*

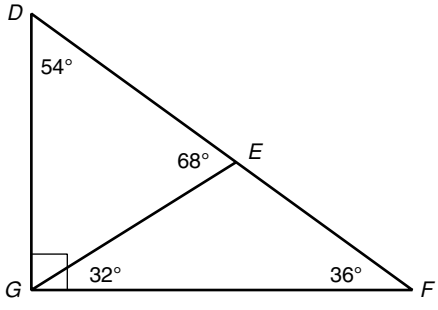
_____

**5.** △*DEG*

_____

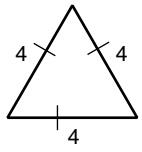
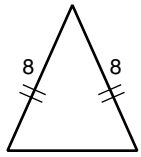
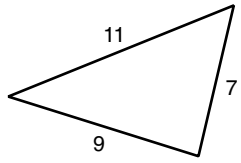
**6.** △*EFG*

_____

# Classifying Triangles by Sides

**LESSON 4-1**

| Equilateral Triangle | Isosceles Triangle | Scalene Triangle |
|---|---|---|
|   |   |   |
| all sides congruent | at least two sides congruent | no sides congruent |

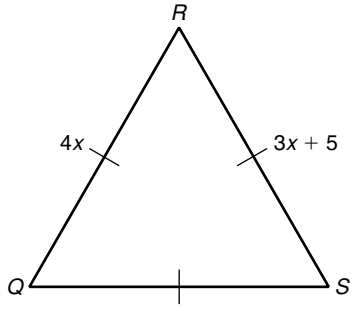
**Step 1** Find the value of $x$.

| | |
|---|---|
| $QR = RS$ | Def. of $\cong$ segs. |
| $4x = 3x + 5$ | Substitution |
| $x = 5$ | Simplify. |

**Step 2** Use substitution to find the length of a side.

| | |
|---|---|
| $4x = 4(5)$ | Substitute 5 for $x$. |
| $= 20$ | Simplify. |

Each side length of $\triangle QRS$ is 20.

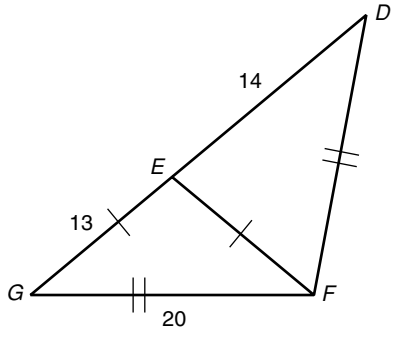



***Classify each triangle by its side lengths.***

**7.** $\triangle EGF$ *is* _____

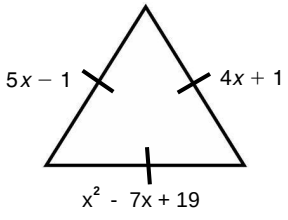
**8.** $\triangle DEF$ *is* _____

**9.** $\triangle DFG$ *is* _____




***Find the side lengths of each triangle.***

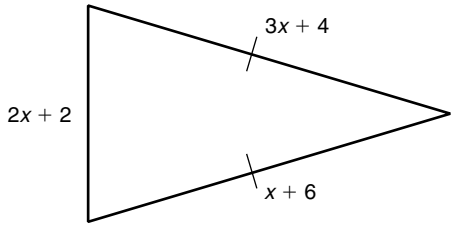
**10.**




*Equation:* _____

$x =$ _____ *Side length =* _____

**11.**




*Equation:* _____

$x =$ _____ *Side lengths =* _____, _____

LESSON 4-1

# Practice A

***Match the letter of the figure to the correct vocabulary word in Exercises 1-4.***

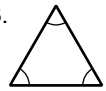
**1.** right triangle _____

**2.** obtuse triangle _____

**3.** acute triangle _____

**4.** equiangular triangle _____

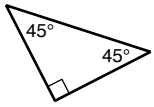
A. 

B. 

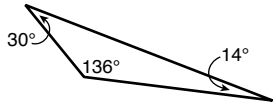
C. 

D. 

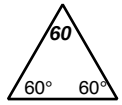
***Classify each triangle by its angle measures as acute, equiangular, right, or obtuse.***
(Note: Give two classifications on # 7.)

**5.** 


_____

**6.** 


_____

**7.** 


*a* _____

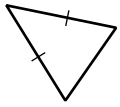
*b* _____

**8.** An isosceles triangle has _____ congruent sides.

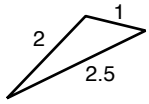
**9.** A(n) _____ triangle has three congruent sides.

**10.** A(n) _____ triangle has no congruent sides.

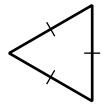
***Classify each triangle by its side lengths as equilateral, isosceles, or scalene.***
(Note: Give two classifications on #13.)

**11.** 

_____

**12.** 


_____

**13.** 

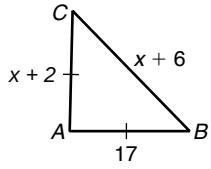
*a* _____

*b* _____

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

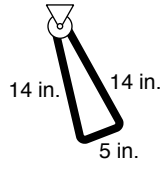
*Equation:* _____

$x =$ _____




**14.** *AB* = _____ *AC* = _____ *BC* = _____

**15.** The New York City subway is known for its crowded cars. If all the seats in a car are taken, passengers must stand and steady themselves with railings or handholds. How many hand straps could have been made from 99 inches of steel?

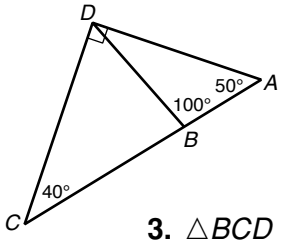



_____

G.1.A LESSON 4-1

# Practice B

***Classify each triangle by its angle measures.***
(Note: Some triangles may belong to more than one class.)




**1.** $\triangle ABD$ _____

**2.** $\triangle ADC$ _____

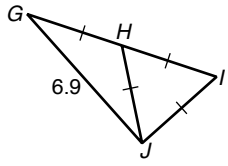
**3.** $\triangle BCD$ _____

***Classify each triangle by its side lengths.***

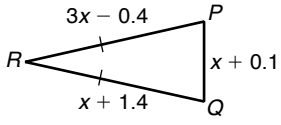
**4.** $\triangle GIJ$ _____

**5.** $\triangle HIJ$ _____

**6.** $\triangle GHJ$ _____




**7.**




*Equation:* _____

*x* = _____

*PQ* = _____ *QR* = _____ *RP* = _____

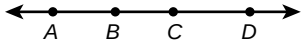
**9.** Use ***a ruler and a compass*** to draw a triangle with sides of 3 cm, 4 cm, and 5 cm.

First draw a 5-cm segment. Then, set your compass to 3 cm and make an arc from one end of the 5-cm segment. Finally, set your compass to 4 cm and make an arc from the other end of the 5-cm segment. Mark the point where the arcs intersect. Connect this point to the ends of the 5-cm segment.

 = show work!

**Choose the best answer.**

**1.** Which list shows all the segments on $\overleftrightarrow{AC}$ that contain the point $B$?




**A** $\overline{AC}$
**B** $\overline{AB}$, $\overline{BC}$, $\overline{BD}$
**C** $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BC}$, $\overline{BD}$
**D** $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BC}$, $\overline{BD}$, $\overline{CD}$

**2.** $M$ is between $R$ and $S$. If $RM = 21$, $RS = 15x - 3$, and $MS = 9x + 12$.

***Draw and label a diagram.***

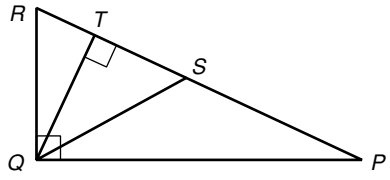
*Equation:* _____ $x =$ _____ $RS =$ _____ $MS =$ _____

**3.** $K$ is the midpoint of $\overline{VW}$. If $KV = 3x$ and $KW = 5x - 10$.

***Draw and label a diagram.***

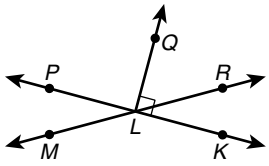
*Equation:* _____ $x =$ _____ $KV =$ _____ $KW =$ _____

**4.** Which appears to be an ***obtuse*** angle?




**F** $\angle PQR$ **H** $\angle R$
**G** $\angle PSQ$ **J** $\angle P$

**5.** Which ***two*** angles are supplementary to $\angle RLK$?




$\angle$_____ and $\angle$_____