

4.2 CLASSIFYING TRIANGLES

Objectives:

Classify triangles by their angle measures and side lengths.
Use triangle classification to find angle measures and side lengths.

Real World Example



The Camel-Back Truss is a style of bridge construction that uses triangles because of their rigid structure. It is just one of the uses for triangles. This lesson is a review of the basics of triangles and their classifications.

All About Triangles

Triangle - **a three sided polygon**

(Remember a polygon is a closed figure made up of segments)

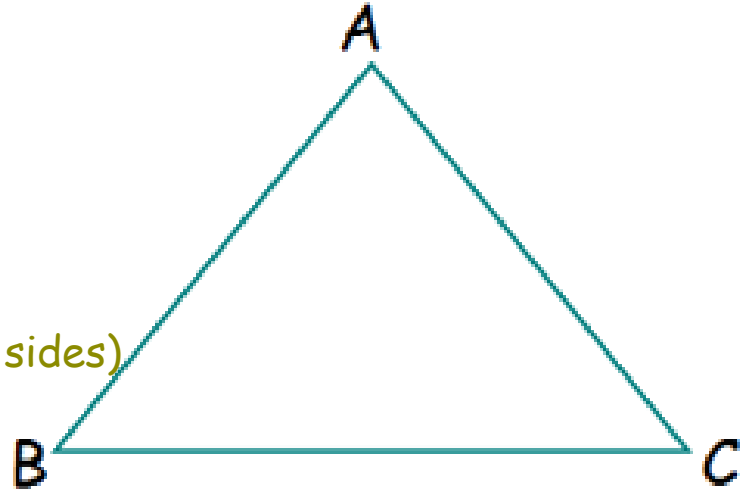
Sides - **Segments**
 \overline{AB} , \overline{AC} , & \overline{BC}

Vertex or vertices – **the corners**
(the endpoints of the sides)

A , B , & C

Naming Triangles - use the vertices

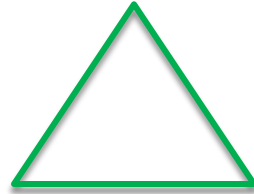
$\triangle ABC$, or $\triangle CAB$, or BAC etc.



Classifying Triangles by Sides

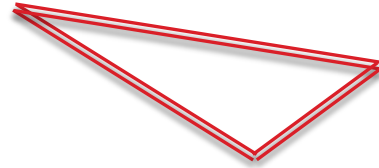
Equilateral
triangle

three congruent sides



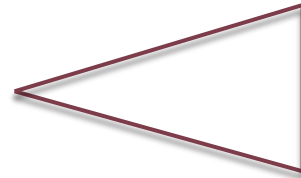
Scalene
triangle

no congruent sides



Isosceles
triangle

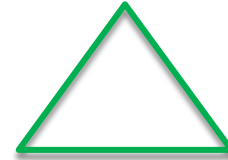
two congruent sides



Classifying Triangles by Angles

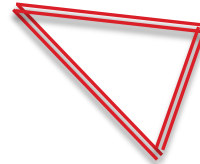
Equiangular
Triangle

three congruent angles



Acute
triangle

three acute angles



Right
triangle

has one right angle.



Obtuse
triangle

one obtuse angle



Opposite Side and Angle

Opposite side

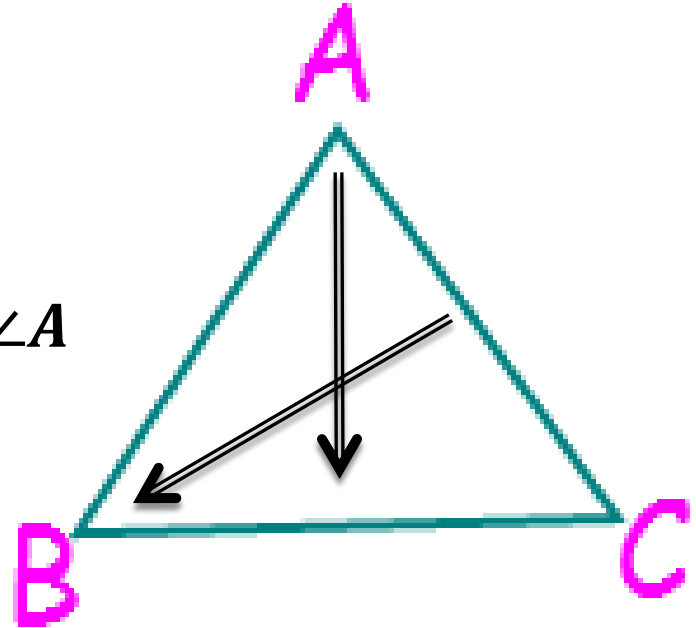
the side across from
a given angle.

\overline{BC} is across from $\angle A$

Opposite angle

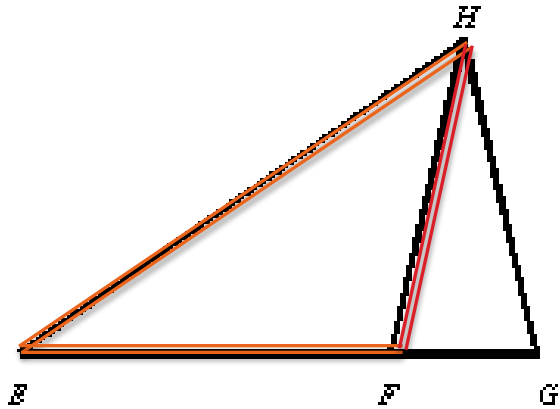
the angle across from a
given side.

$\angle B$ is across from \overline{AC}



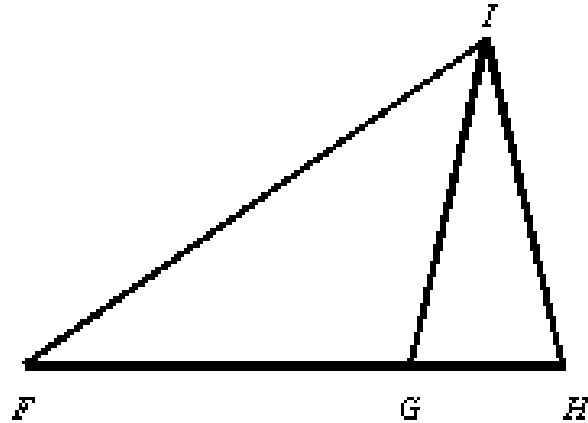
For Example 1

Name all the sides of $\triangle EFH$.



\overline{EF} , \overline{FH} , & \overline{EH}

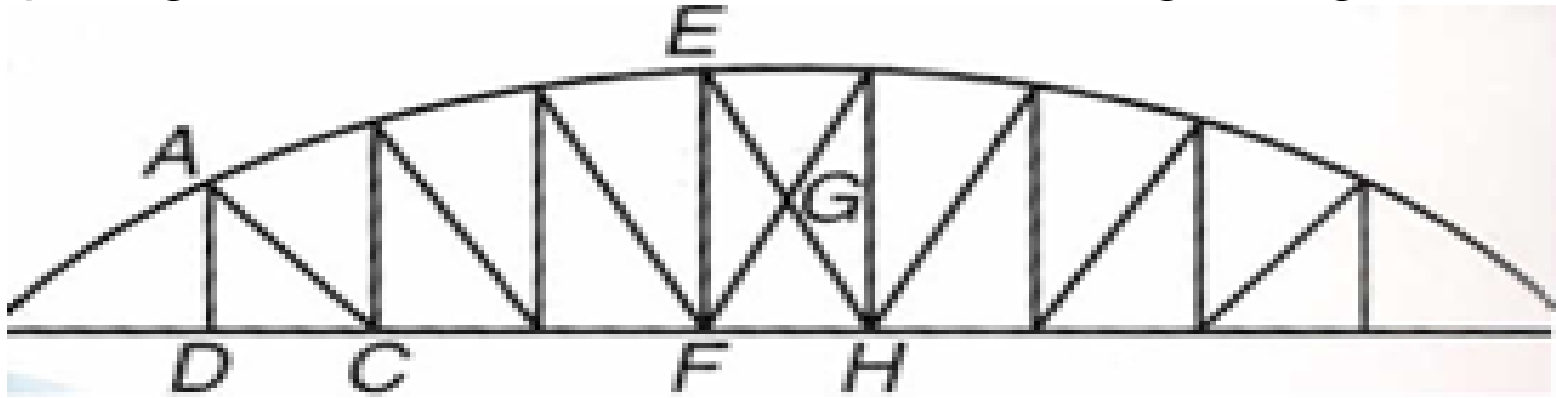
Name all the vertices of $\triangle GHI$.



G , H , & I

For Example 2

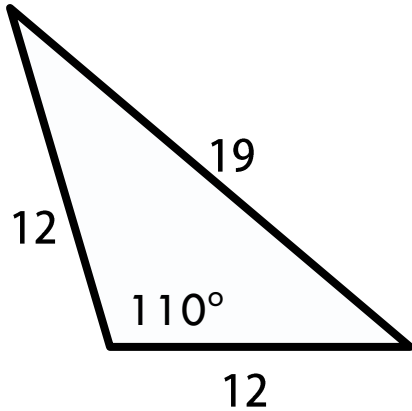
Classify $\triangle FGH$, $\triangle ADC$, and $\triangle EFG$ as acute, obtuse, right, or equiangular in this Camel-Back Truss bridge diagram.



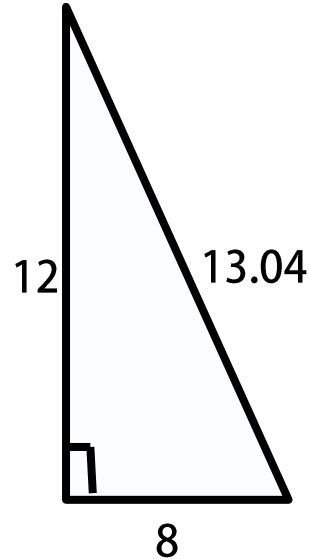
$\triangle FGH$ – equiangular, $\triangle ADC$ – right, & $\triangle EFG$ – obtuse

For Example 3

Classify each triangle by its angles and sides.



Isosceles obtuse



Scalene right

For Example 4

$\triangle PQR$ is an equilateral triangle. One side measures $2x + 5$ and another side measures $x + 35$. Find the length of each side.

Since the sides of an equilateral triangle are all congruent we set the two sides measures equal to each other.

$$\begin{aligned} 2x + 5 &= x + 35 \\ -x & \qquad \qquad -5 \\ x &= 30 \end{aligned}$$

*Don't forget to plug x back in
All the side lengths are 65.*

A horizontal bar at the top of the slide, divided into a red section on the left and a teal section on the right.

The End

Thanks for watching!