

Angles and Lines

Objective 1: Angle Definitions

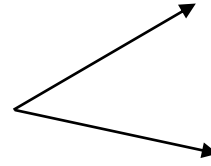
Parts of an Angle

An angle is formed by 2 rays with the same initial point.

Vertex – the point where the two sides meet

Sides – rays that connect at the vertex

Measure of an Angle - the amount of rotation between the sides, measured in degrees.



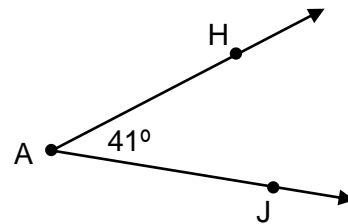
Ex) Use the figure at right to answer the following.

Name the Vertex

Name the Sides

Name the Angle in 3 ways

Give the measure of Angle A



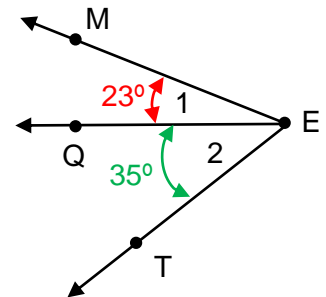
Ex) Use the figure at right to answer the following.

Give another name for $\angle 1$

Give another name for $\angle QET$

Give the $m\angle 2$

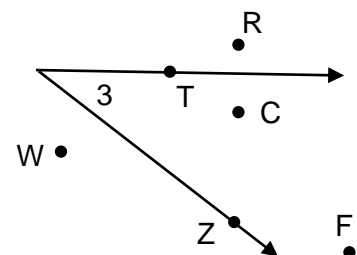
Explain why we cannot name any of the angles " $\angle E$ "



Interior and Exterior Regions of an Angle

Name the points on the interior of $\angle 3$

Name the points on the exterior of $\angle 3$

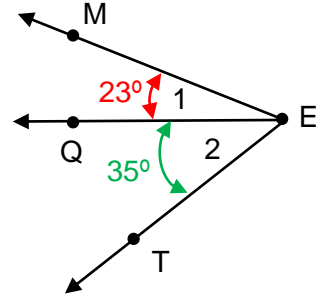


Adjacent Angles – angles that share one side but no interior points.

Angle Addition - finds the measure of the larger angle formed by two adjacent angles, by adding together the measures of the two adjacent angles.

Ex) Name the adjacent angles.

Explain why $\angle 1$ and $\angle MET$ are NOT adjacent angles even though they share a side.

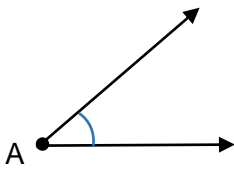


Determine $m\angle MET$

Classifying Angles by their Measures

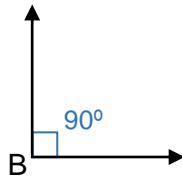
Acute Angle

$$0^\circ < m\angle A < 90^\circ$$



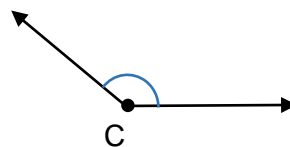
Right Angle

$$m\angle B = 90^\circ$$



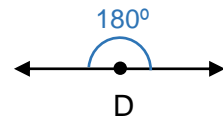
Obtuse Angle

$$90^\circ < m\angle C < 180^\circ$$

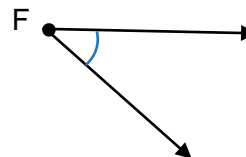
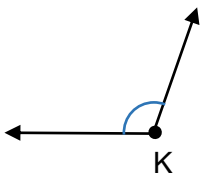
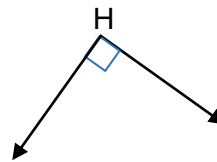
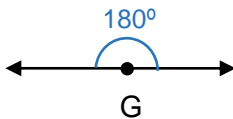


Straight Angle

$$m\angle D = 180^\circ$$



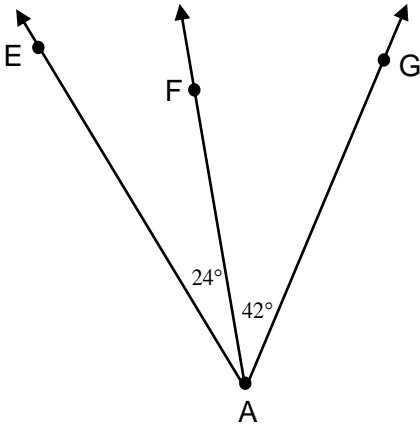
Ex) Classify each angle by its measure.



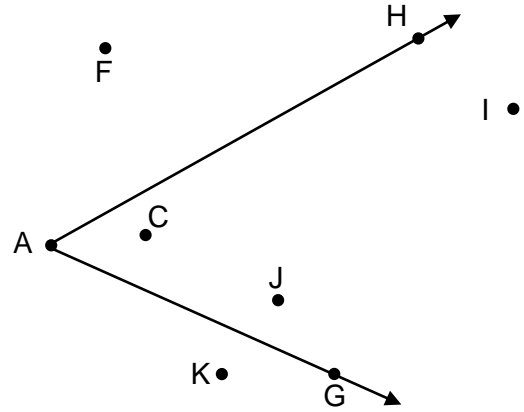
Pause the video and try these problems on your own.

1) Use the figure to answer the following:

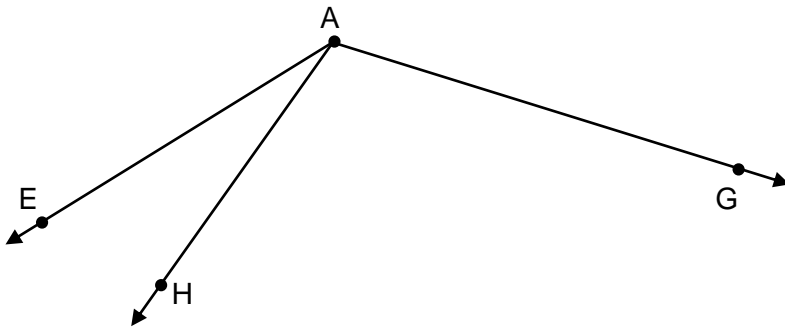
What is the measure of $\angle EAF$?



2) Which points lie on the interior of the angle?



3) Are the angles $\angle EAH$ and $\angle EAG$ adjacent?

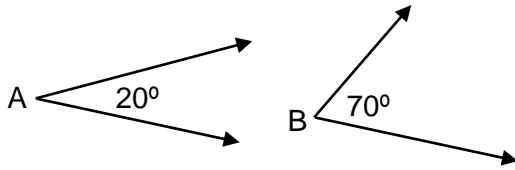


Restart the video when you are ready to check your answers.

Objective 2: Complementary, Supplementary, and Vertical Angles

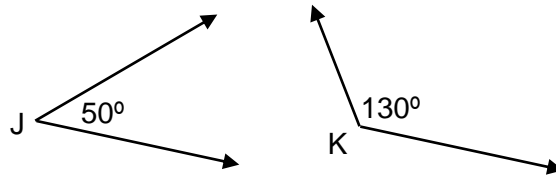
Complementary Angles

If the sum of the measures of two angles is 90° , then the two angles are complementary.

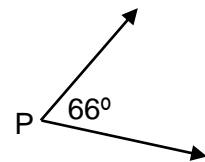


Supplementary Angles

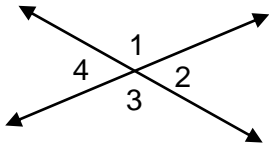
If the sum of the measures of two angles is 180° , then the two angles are supplementary.



Ex) Find the complement and the supplement of the given angle.



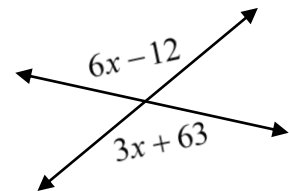
Vertical Angles - The nonadjacent angles formed by intersecting lines.



Vertical Angles are Congruent, so they have the same measure.

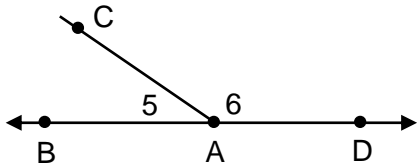
Name the pairs of congruent vertical angles.

Ex) Solve for x and find the measures of the angles in degrees.



Linear Pair

If the exterior sides of two adjacent angles are opposite rays, then the angles form a linear pair.

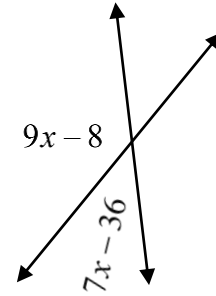


Name the sides that are opposite rays:

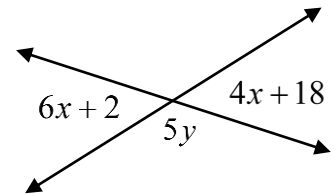
Name the angles that form a Linear Pair:

What relationship do these two angles have?

Ex) Solve for x and find the measures of the angles in degrees.

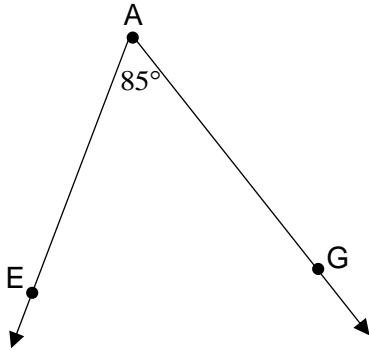


Ex) Solve for x and y , then find the measures of the angles in degrees.

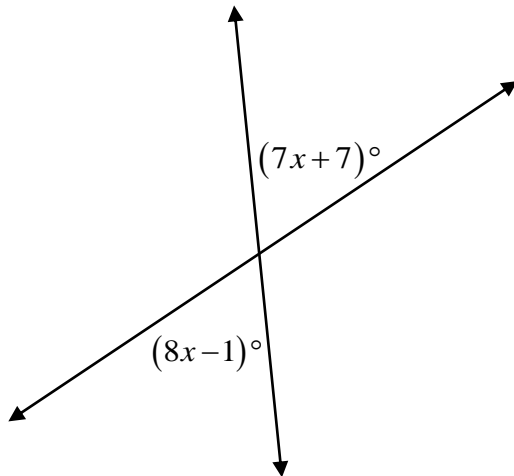


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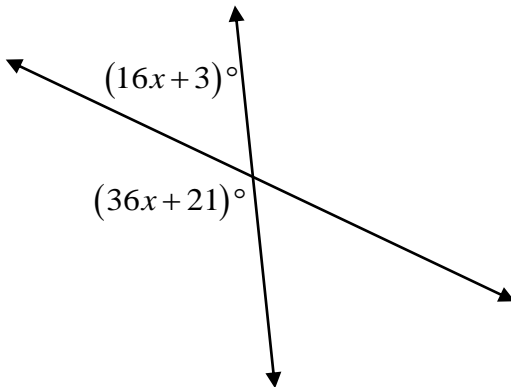
1) Find the complement and the supplement of the given angle.



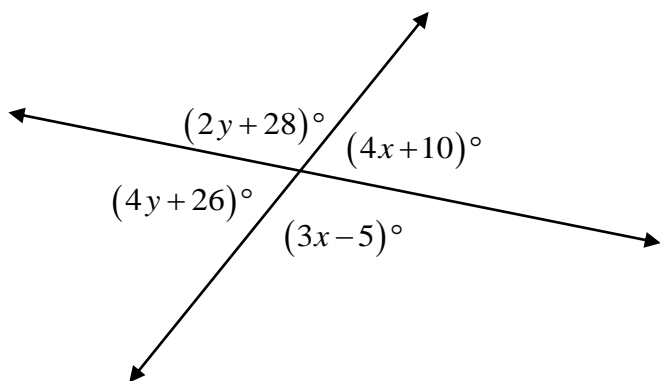
2) Solve for x and then find the measures of the angles in degrees.



3) Solve for x and then find the measures of the angles in degrees.



4) Solve for x and y , then find the measure of the angles in degrees.



Restart the video and check your answers.

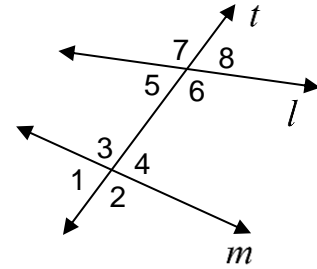
Objective 3: Lines Cut by a Transversal

Transversal – a line that intersects 2 or more other lines.

In the diagram, transversal t intersects lines l and m .

Interior Angles – the four angles between the two lines

Exterior Angles – the four angles outside of the two lines



Special Angle Pairs formed when 2 lines are cut by a transversal

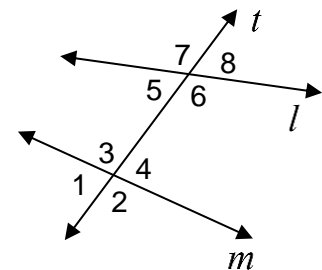
Corresponding Angles – angles in the same relative position

Alternate Interior Angles – interior angles on alternating sides of the transversal

Alternate Exterior Angles - exterior angles on alternating sides of the transversal

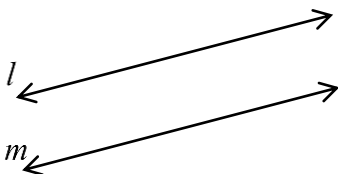
Same Side Interior Angles – interior angles on the same side of the transversal

Same Side Exterior Angles – exterior angles on the same side of the transversal



Parallel Lines

If two lines in a plane never intersect, then the lines are parallel. They have the same slope.

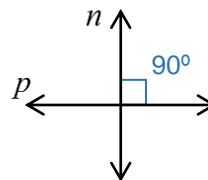


Using symbols:

In words:

Perpendicular Lines

If two lines intersect to form a right angle, then the lines are perpendicular.



Using symbols:

In words:

Special Angle Relationships for Two Parallel Lines Cut by a Transversal.

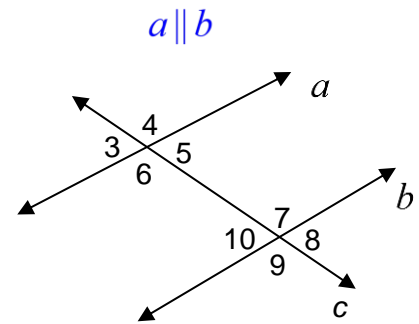
|| lines → Corresponding Angles are Congruent

|| lines → Alternate Interior Angles are Congruent

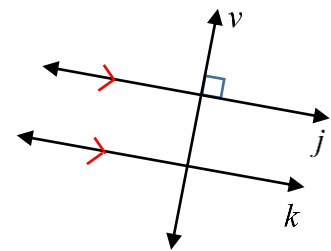
|| lines → Alternate Exterior Angles are Congruent

|| lines → Same Side Interior Angles are Supplementary

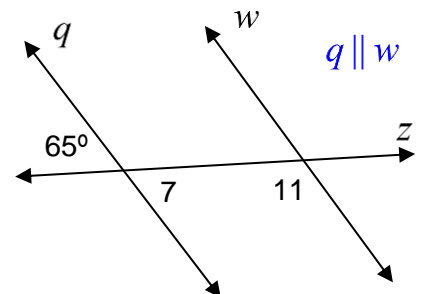
|| lines → Same Side Exterior Angles are Supplementary



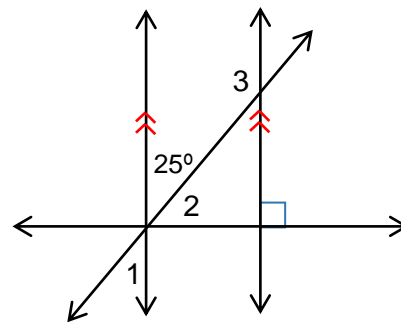
Ex) Determine the relationship between lines v and k .



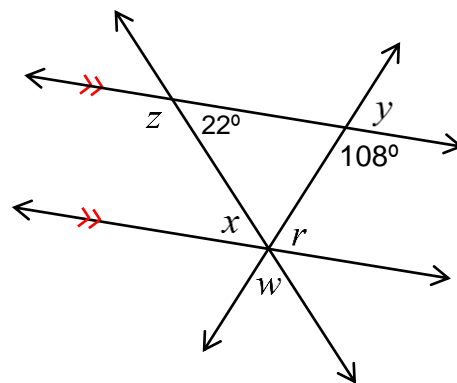
Ex) Find $m\angle 7$ and $m\angle 11$. Give reasons.



Ex) Find $m\angle 1$, $m\angle 2$, $m\angle 3$. Give reasons.

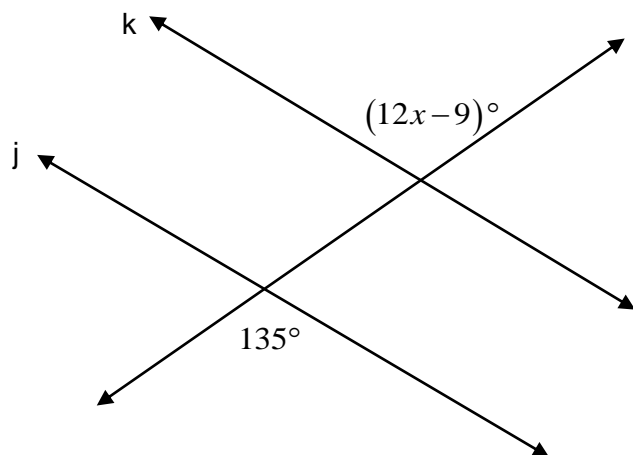


Ex Find all the variables in the diagram. Give reasons.

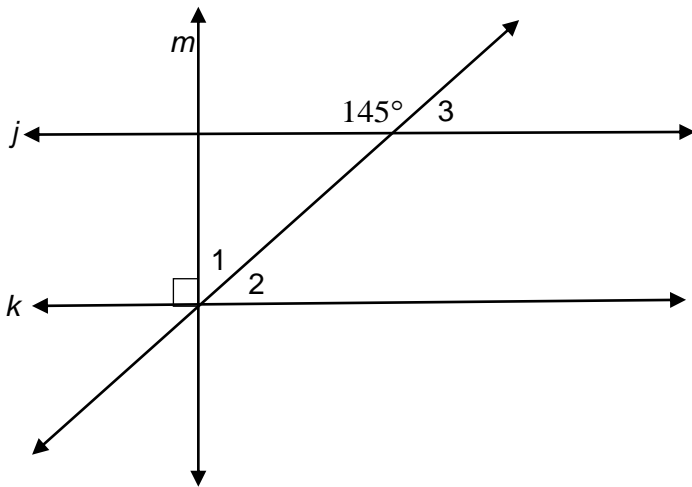


Pause the video to try this one on your own, then restart when you are ready to check your answer.

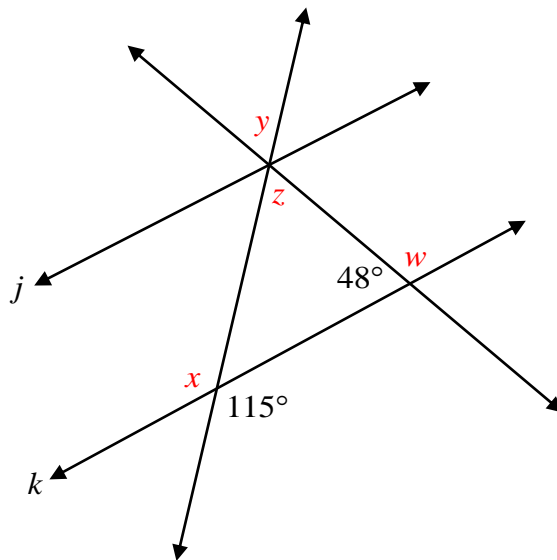
1) Given $j \parallel k$. Find the value of x and state the angle relationship used to solve for the variable.



2) Given $j \parallel k$ and $m \perp j$, find $m\angle 1$, $m\angle 2$, and $m\angle 3$.



3) Given $j \parallel k$ and $m \perp j$, find all of the variables in the diagram.

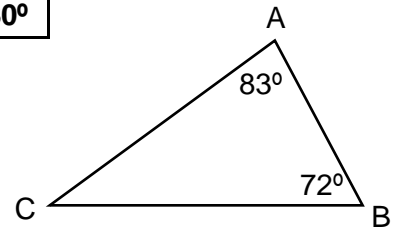


Restart the video and check your answers.

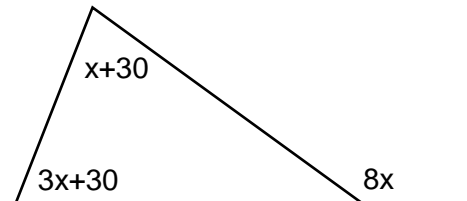
Objective 4: Triangles and their Angles

Triangle Sum Theorem - the 3 angle measures in a triangle add to 180°

Ex) Find $m\angle C$ in $\triangle ABC$



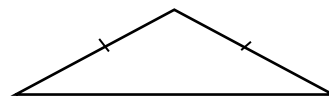
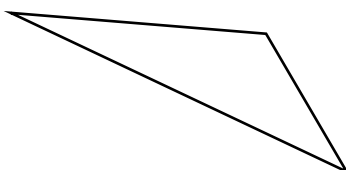
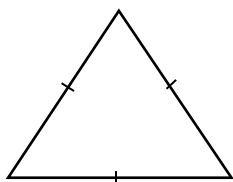
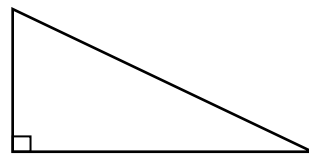
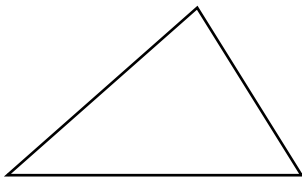
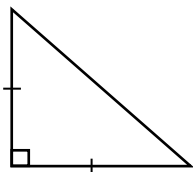
Ex) Solve for x, and find the unknown angle measures in degrees.



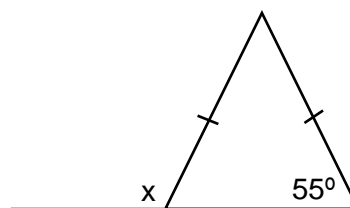
Classifying a Triangle by its Angles			
<p>Acute Triangle All 3 angles are $< 90^\circ$</p>	<p>Obtuse Triangle One angle is obtuse.</p>	<p>Equiangular Triangle All 3 angles are equal.</p>	<p>Right Triangle One angle is 90°.</p>

Classifying a Triangle by its Sides		
<p>Equilateral Triangle Three congruent sides.</p>	<p>Isosceles Triangle Two congruent sides.</p>	<p>Scalene Triangle No congruent sides.</p>

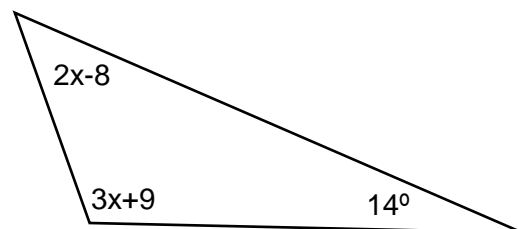
Ex) Classify each triangle by its sides and angles.



Ex) Solve for the unknown angle.

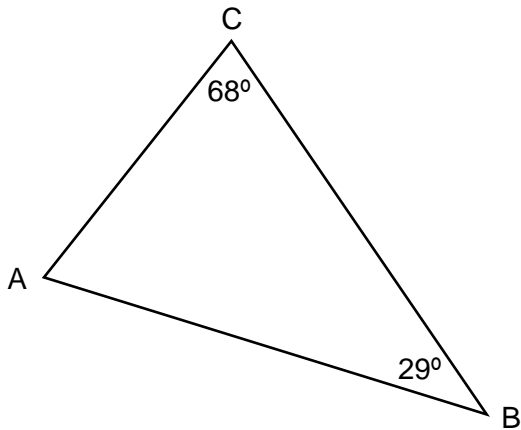


Ex) Solve for the variable and find the unknown angles in degrees.

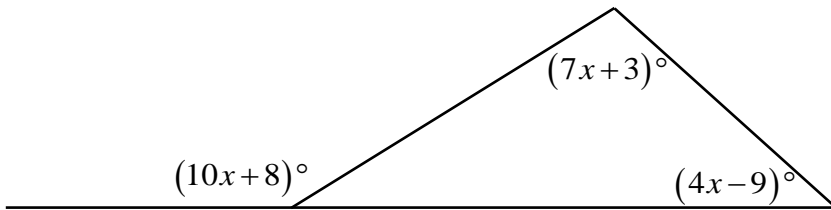


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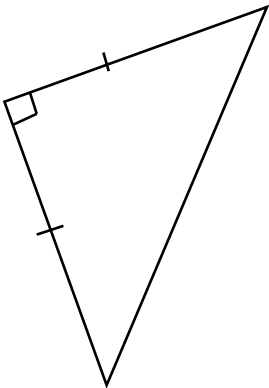
1) Given the triangle, find $m\angle A$.



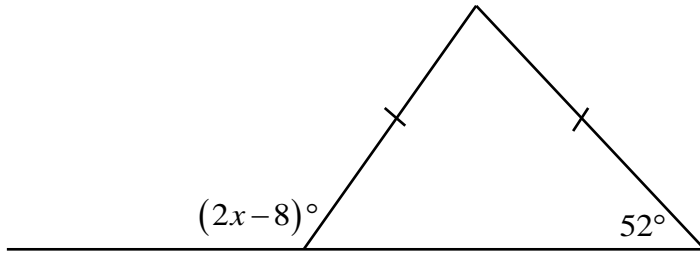
2) Solve for x and find the three interior angles of the triangle.



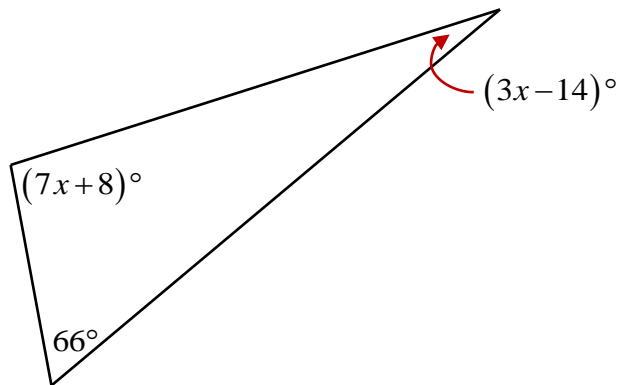
3) Classify the triangle by its sides and angles.



4) Solve for x and the unknown angle.



5) Solve for the variable and find the measures of the unknown angles in degrees.



Restart the video and check your answers.