

Lesson 10: Angle Problems and Solving Equations

Classwork

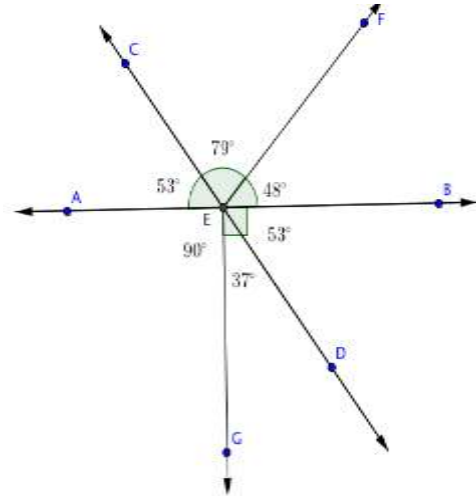
Angle Facts and Definitions

Name of Angle Relationship	Angle Fact	Diagram
Adjacent Angles		
Vertical Angles (vert. \angle s)		
Angles on a Line (\angle s on a line)		
Angles at a Point (\angle s at a point)		

Opening Exercise

Use a protractor, measure all the angles and complete the chart to follow.

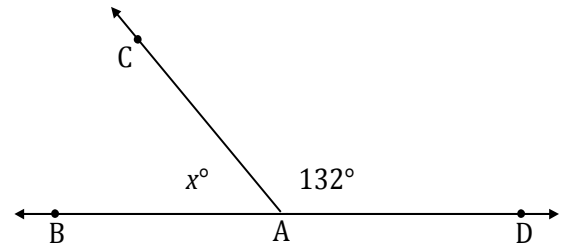
	Name the Angles that are
Vertical	
Adjacent	
Angles on a Line	
Angles at a Point	



Example 1

Estimate the measurement of x . ____

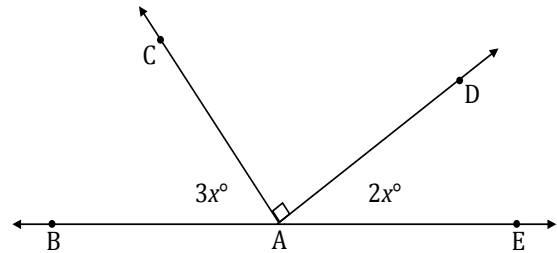
In a complete sentence, describe the angle relationship in the diagram.



Write an equation for the angle relationship shown in the figure and solve for x . Then find the measures of $\angle BAC$ and confirm your answers by measuring the angle with a protractor.

Exercise 1

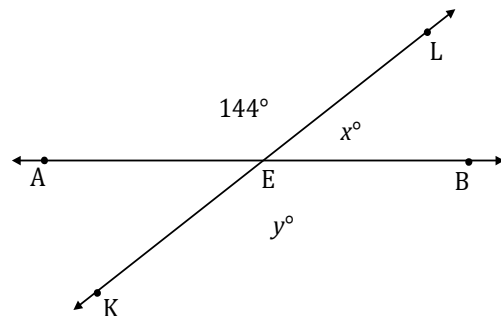
In a complete sentence, describe the angle relationship in the diagram.



Find the measurements of $\angle BAC$ and $\angle DAE$.

Example 2

In a complete sentence, describe the angle relationship in the diagram.

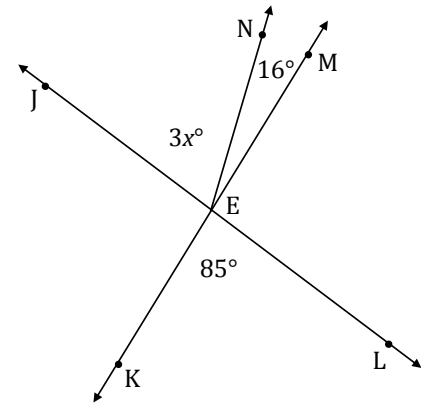


Write an equation for the angle relationship shown in the figure and solve for x and y . Find the measurements of $\angle LEB$ and $\angle KEB$.

Exercise 2

In a complete sentence, describe the angle relationships in the diagram.

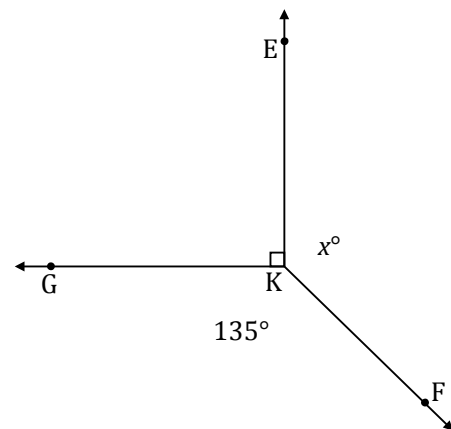
Write an equation for the angle relationship shown in the figure and solve for x .



Example 3

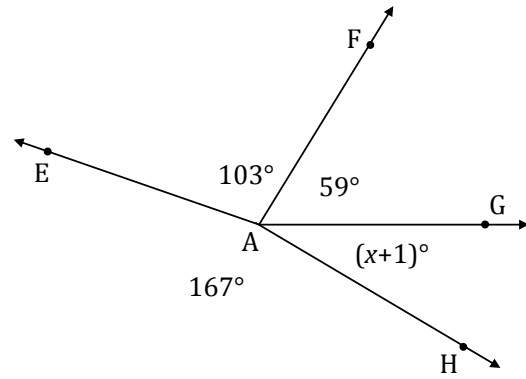
In a complete sentence, describe the angle relationships in the diagram.

Write an equation for the angle relationship shown in the figure and solve for x . Find the measurement of $\angle EKF$ and confirm your answers by measuring the angle with a protractor.



Exercise 3

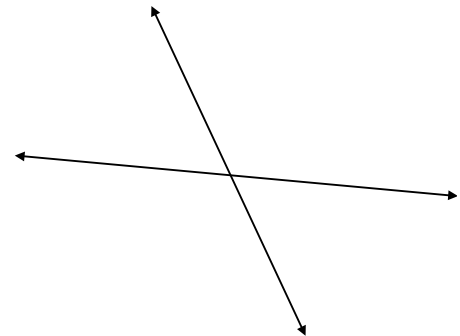
In a complete sentence, describe the angle relationships in the diagram.



Find the measurement of $\angle GAH$.

Example 4

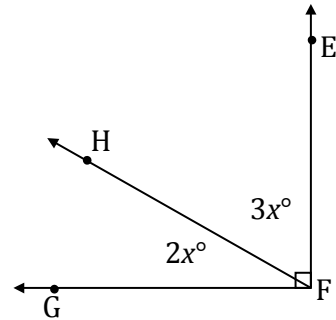
Two lines intersect in the following figure. In the figure, the ratio of the measurements of the obtuse angle to the acute angle in any adjacent angle pair is 2: 1. In a complete sentence, describe the angle relationships in the diagram.



Label the diagram with expressions that describe this relationship. Write an equation that models the angle relationship and solve for x . Find the measurements of the acute and obtuse angles.

Exercise 4

The ratio of $\angle GFH$ to $\angle EFH$ is 2:3. In a complete sentence, describe the angle relationships in the diagram.



Find the measures of $\angle GFH$ and $\angle EFH$.

Relevant Vocabulary

Adjacent Angles: Two angles $\angle BAC$ and $\angle CAD$ with a common side \overrightarrow{AC} are adjacent angles if C belongs to the interior of $\angle BAD$.

Vertical Angles: Two angles are *vertical angles* (or *vertically opposite angles*) if their sides form two pairs of opposite rays.

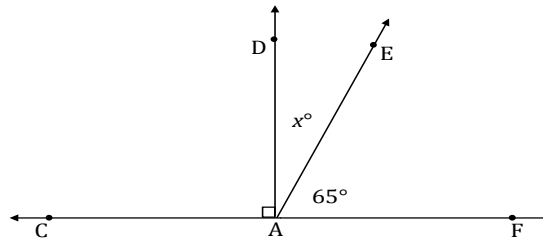
Angles on a Line: The sum of the measures of adjacent angles on a line is 180° .

Angles at a Point: The sum of the measures of adjacent angles at a point is 360° .

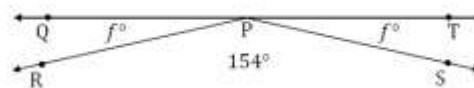
Problem Set

For each question, use angle relationships to write an equation in order to solve for each variable. Determine the indicated angles. You can check your answers by measuring each angle with a protractor.

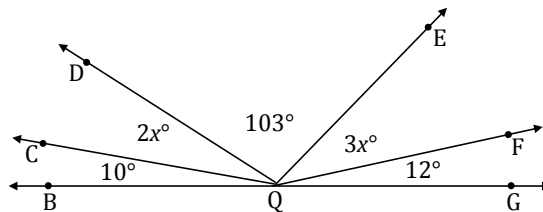
1. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measurement of $\angle DAE$.



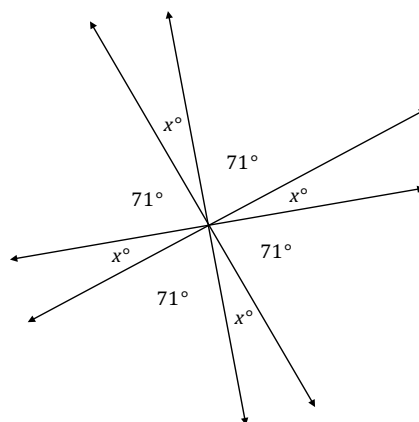
2. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measurement of $\angle QPR$.



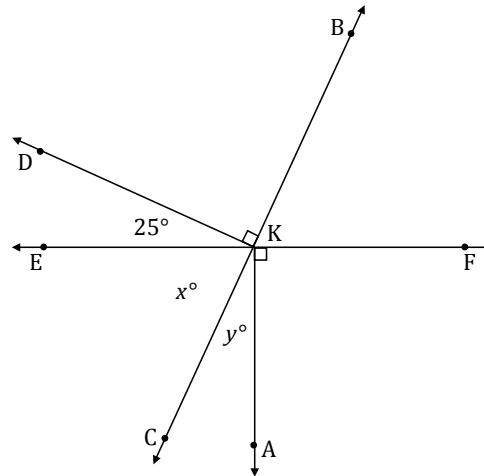
3. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measurements of $\angle CQD$ and $\angle EQF$.



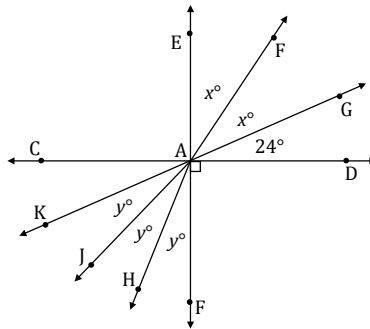
4. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measure of x .



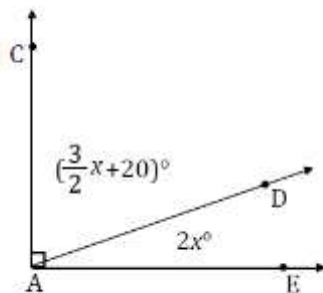
5. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measure of x and y .



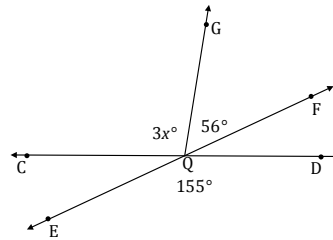
6. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measure of x and y .



7. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measure of $\angle CAD$ and $\angle DAE$.



8. In a complete sentence, describe the relevant angle relationships in the following diagram. Find the measure of $\angle CQG$.



9. The ratio of the measures of a pair of adjacent angles on a line is 4:5.
- Find the measures of the two angles.
 - Draw a diagram to scale of these adjacent angles. Indicate the measurements of each angle.
10. The ratio of the measures of three adjacent angles on a line is 3:4:5. Find the measures of the three angles.
- Find the measures of the three angles.
 - Draw a diagram to scale of these adjacent angles. Indicate the measurements of each angle.