Lesson 6: Solve for Unknown Angles—Angles and Lines at a Point

Classwork

Discussion

Two angles $\angle AOC$ and $\angle COB$, with a common side $\overrightarrow{OC}$, are _____ if C belongs to the interior of $\angle AOB$. The sum of angles on a straight line is 180°. Two angles are called supplementary if the sum of their measures is _____; two angles are called complementary if the sum of their measures is _____. Describing angles as supplementary or complementary refers only to the measures of their angles; the positions of the angles or whether the pair of angles is adjacent to each other is not part of the definition.

In the figure, AB is a straight line.
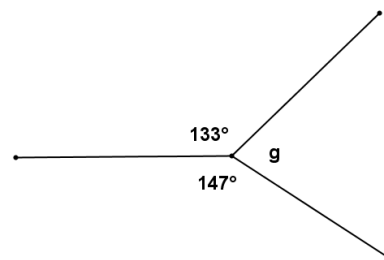Find the measure of $\angle f$.

$\angle f = $ _____
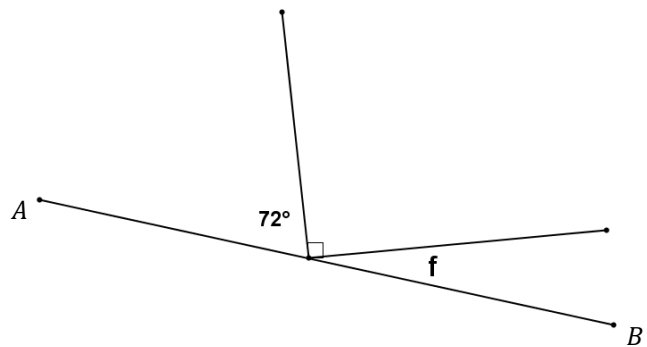
The total measure of adjacent angles around a point is _____.
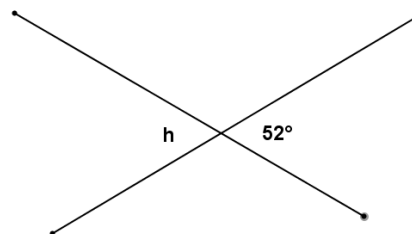
Find the measure of $\angle g$.

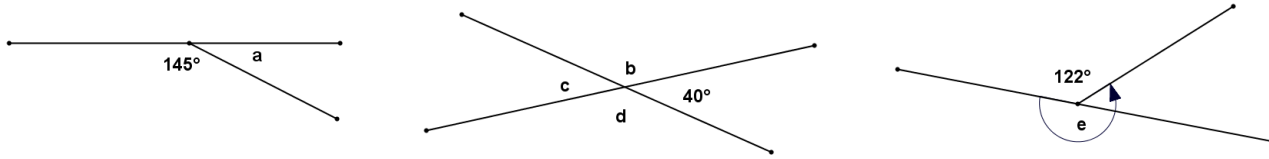$\angle g = $ _____

Vertical angles have _____ measure.

Find the measure of $\angle h$.

$\angle h = $ _____

Example 1

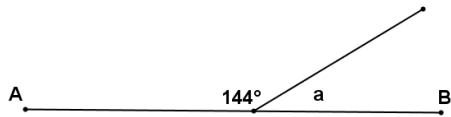Find the measures of each labeled angle. Give a reason for your solution.

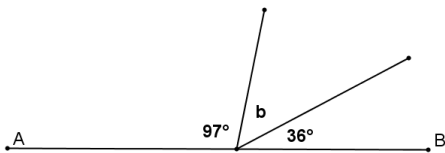| Angle	Angle measure	Reason
$\angle a$		
$\angle b$		
$\angle c$		
$\angle d$		
$\angle e$		

Exercises

In the figures below, AB, CD, and EF are straight lines. Find the measure of each marked angle or find the unknown numbers labeled by the variables in the diagrams. **Give reasons** for your calculations. Show all the steps to your solution.
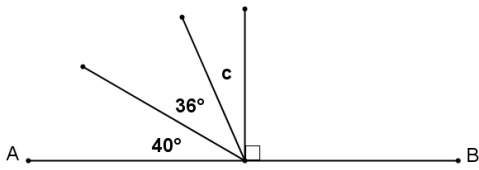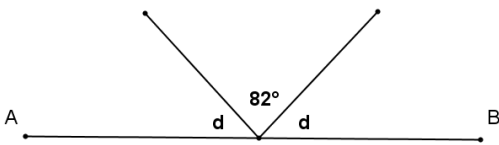
1.

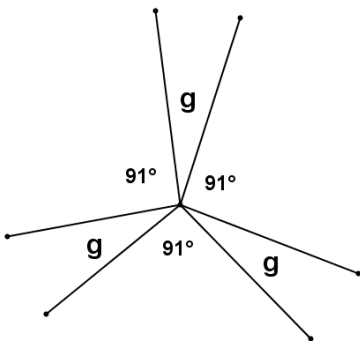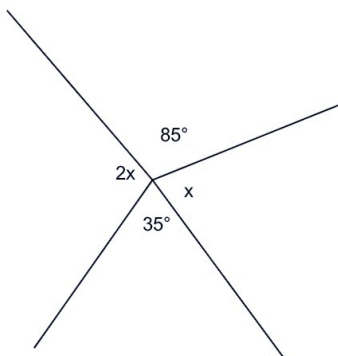$\angle a =$ _____

2.

$\angle b =$ _____

3.

∠c = _____

4.

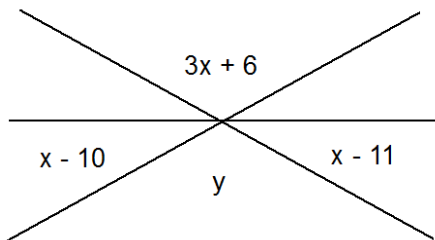∠d = _____

5.

∠g = _____

6.

x = _____

7.

$y =$ _____ $x =$ _____

8.

$x =$ _____

9.

$x =$ _____

10.

$x =$ _____ $y =$ _____
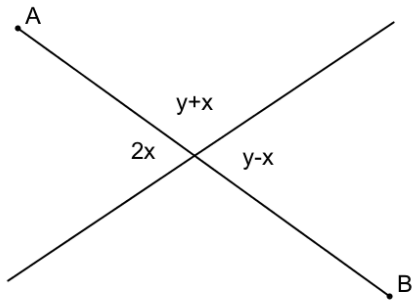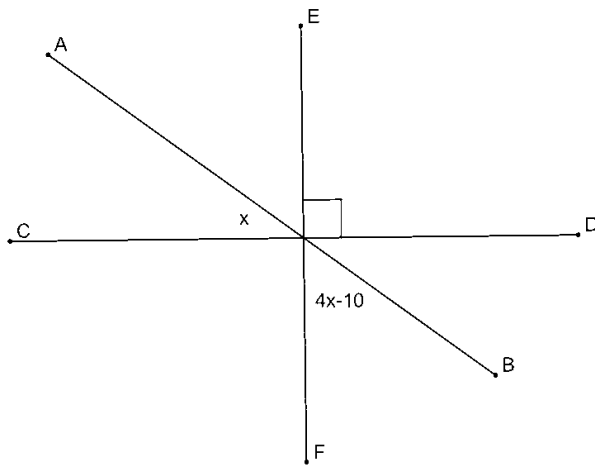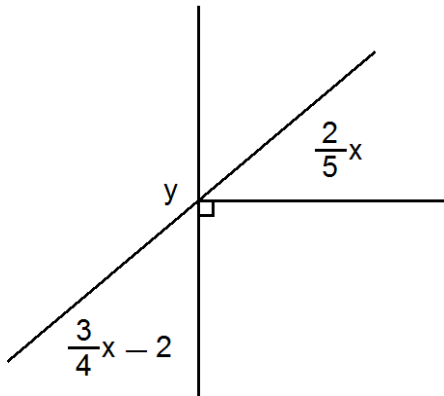
For Problems 11–12, find the values of x and y. Show all the steps to your solution.

11.

$x =$ _____

12.

$x =$ _____ $y =$ _____
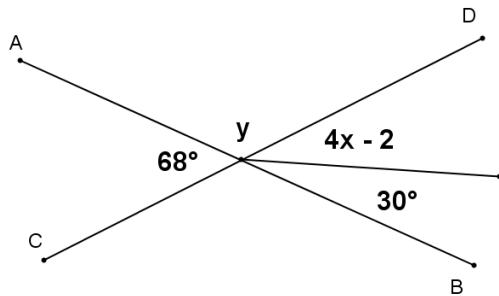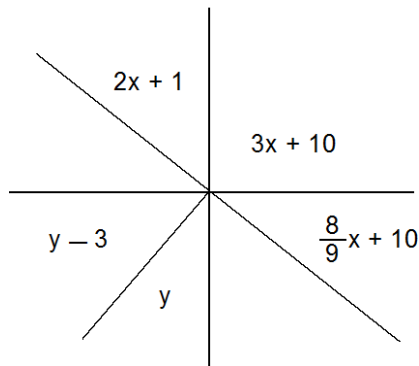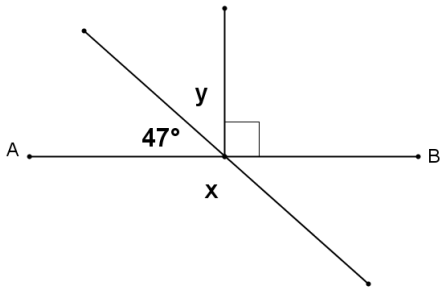
Relevant Vocabulary

Straight Angle: If two rays with the same vertex are distinct and collinear (i.e., they form a line), then each of the angles formed by the line is called a *straight angle.*

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

Problem Set

Find the value of x and/or y in each diagram below. Show all the steps to your solution.
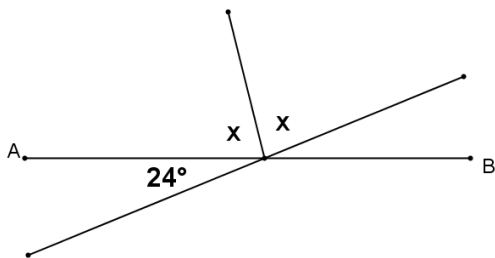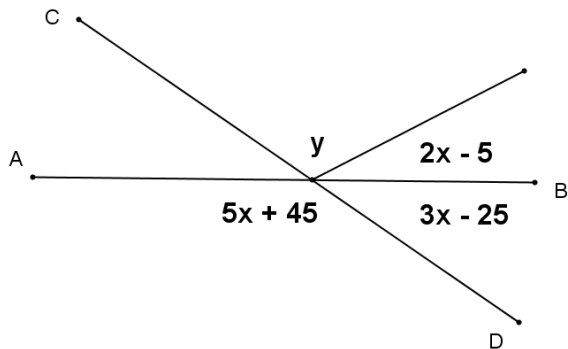
1.

$x =$ _____

$y =$ _____

2.

$x =$ _____

3.

$x =$ _____

$y =$ _____