

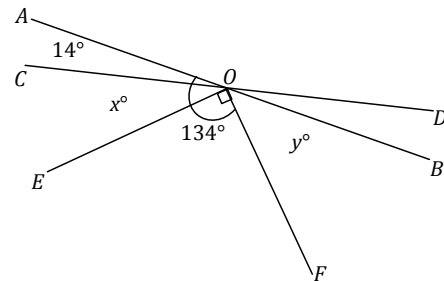
## Lesson 3: Solving for Unknown Angles using Equations

### Classwork

#### Opening Exercise

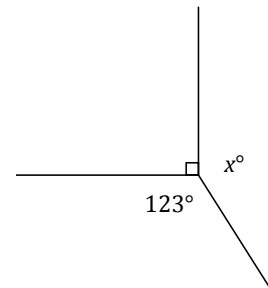
Two lines meet at the common vertex of two rays; the measurement of find the value of and .

. Set up and solve an equation to



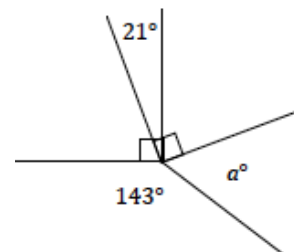
#### Example 1

Set up and solve an equation to find the value of .



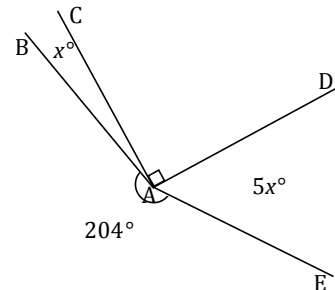
#### Exercise 1

Five rays meet at a common vertex. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of .



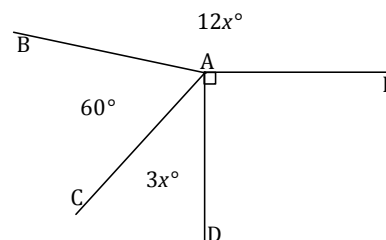
### Example 2

Four rays meet at a common vertex. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Find the measurements of angles  $\angle B$  and  $\angle D$ .



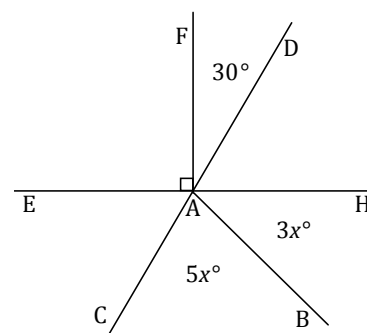
### Exercise 2

Four rays meet at a common vertex. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Find the measurement of  $\angle B$ .



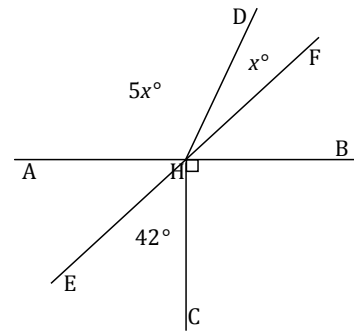
### Example 3

Two lines meet at the common vertex of two rays. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Find the measurements of angles  $\angle B$  and  $\angle D$ .

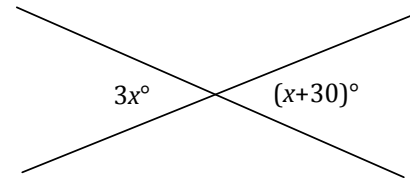


**Exercise 3**

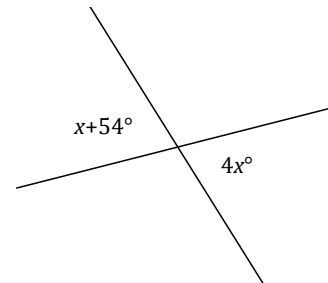
Two lines meet at the common vertex of two rays. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Find the measurements of angles  $\angle ADE$  and  $\angle BFC$ .

**Example 4**

Two lines meet at a point. Set up and solve an equation to find the value of  $x$ . Find the measurement of one of the vertical angles.

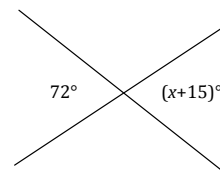
**Exercise 4**

Set up and solve an equation to find the value of  $x$ . Find the measurement of one of the vertical angles.

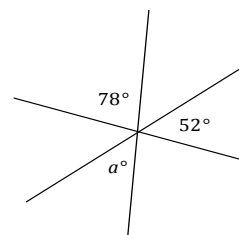


## Problem Set

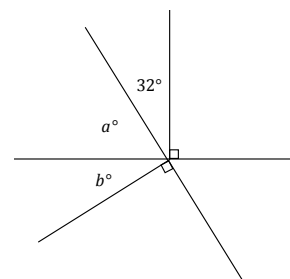
1. Two lines meet at a point. Set up and solve an equation to find the value of  $x$ .



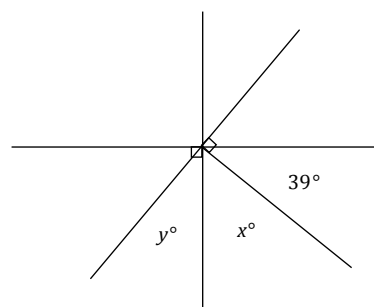
2. Three lines meet at a point. Set up and solve an equation to find the value of  $a$ . Is your answer reasonable? Explain how you know.



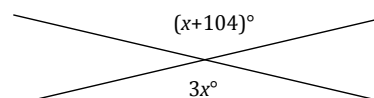
3. Two lines meet at the common vertex of two rays. Set up and solve an equation to find the values of  $a$  and  $b$ .



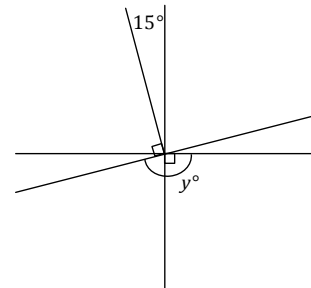
4. Two lines meet at the common vertex of two rays. Set up and solve an equation to find the values of  $x$  and  $y$ .



5. Two lines meet a point. Find the measurement of a vertical angle. Is your answer reasonable? Explain how you know.



6. Three lines meet at the vertex of a ray. Set up and solve an equation to find the value of  $y$ .



7. Three angles are at a point. The second angle is  $x$  more than the first, and the third angle is  $y$  more than the second angle.
- Find the measurement of all three angles.
  - Compare the expressions you used for the three angles and their combined expression. Explain how they are equal and how they reveal different information about this situation.
8. Four adjacent angles are on a line. The measurements of the four angles are four consecutive even numbers. Determine the measurements of all four angles.
9. Three angles are at a point. The ratio of the measurement of the second angle to the measurement of the first angle is  $2:1$ . The ratio of the measurement of the third angle to the measurement of the second angle is  $3:2$ . Determine the measurements of all three angles.
10. Solve for  $x$  and  $y$  in the following diagram.

