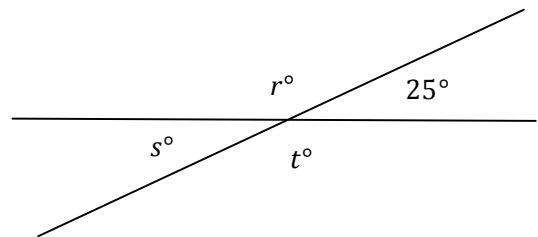


## Lesson 2: Solving for Unknown Angles Using Equations

### Classwork

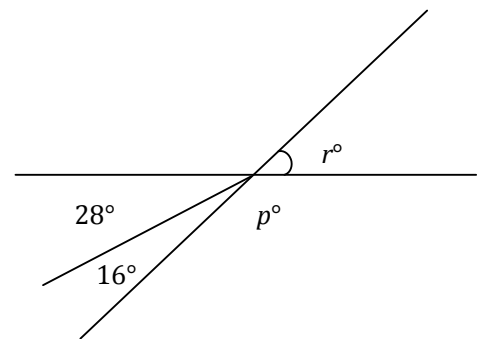
#### Opening Exercise

Two lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Find the values of  $s$ ,  $r$ , and  $t$ .



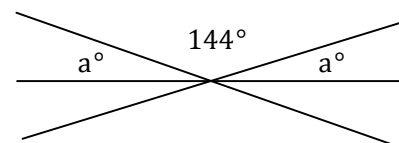
#### Example 1

Two lines meet at the vertex of a ray. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $p$  and  $r$ .



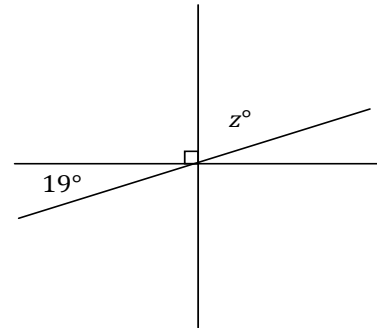
#### Exercise 1

Three lines meet at a point. In a complete sentence, describe the relevant angle relationship in the diagram. Set up and solve an equation to find the value of  $a$ .



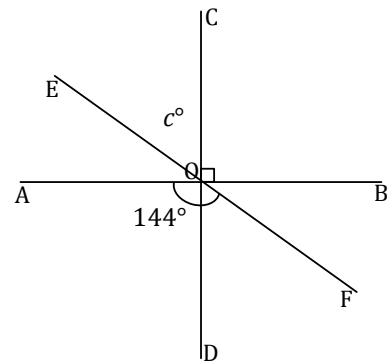
**Example 2**

Three lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $z$ .



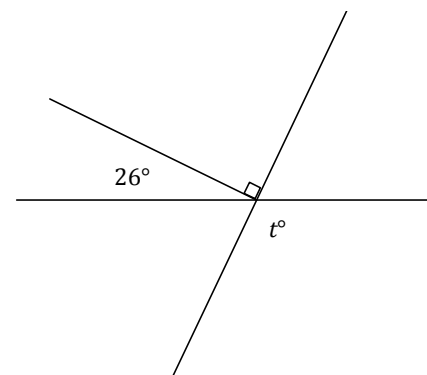
**Exercise 2**

Three lines meet at a point;  $c$ . In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to determine the value of  $t$ .



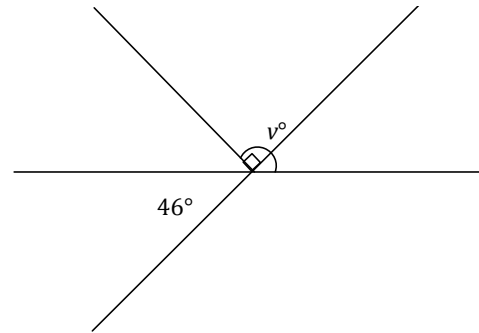
**Example 3**

Two lines meet at the vertex of a ray. The ray is perpendicular to one of the lines as shown. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $t$ .



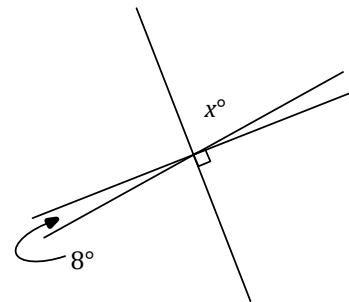
**Exercise 3**

Two lines meet at the vertex of a ray. The ray is perpendicular to one of the lines as shown. In a complete sentence, describe the relevant angle relationships in the diagram. You may add labels to the diagram to help with your description of the angle relationship. Set up and solve an equation to find the value of  $x$ .



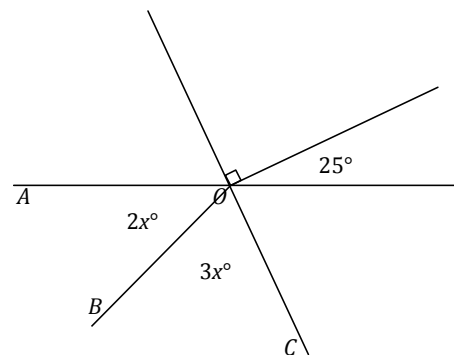
**Example 4**

Three lines meet at a point. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Is your answer reasonable?



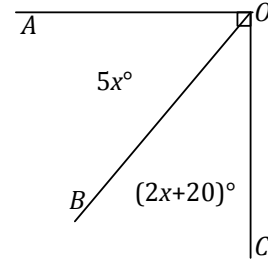
**Exercise 4**

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  $\angle A$  and  $\angle B$ .



**Exercise 5**

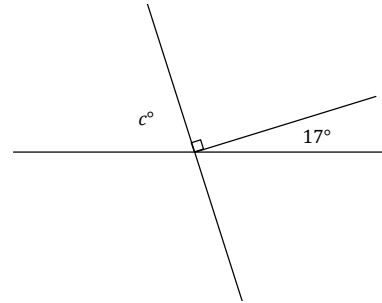
- a. In a complete sentence, describe the relevant angle relationships in the diagram. Set up and solve an equation to find the value of  $x$ . Find the measurements of  $\angle A$  and  $\angle C$ .



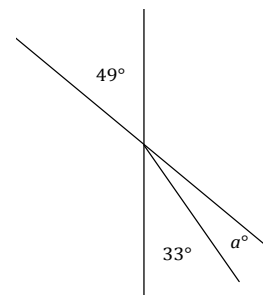
- b. Katrina was solving the problem above and wrote the equation  $5x + (2x + 20) = 90$ . Then she rewrote this as  $7x + 20 = 90$ . Why did she rewrite the equation in this way? How does this help her to find the value of  $x$ ?

**Problem Set**

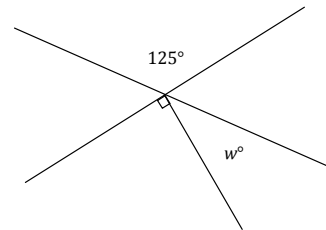
1. Two lines meet at the vertex of a ray. Set up and solve an equation to find the value of  $c$ .



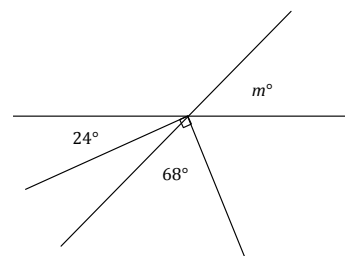
2. Two lines meet at the vertex of a ray. Set up and solve an equation to find the value of  $a$ . Explain why your answer is reasonable.



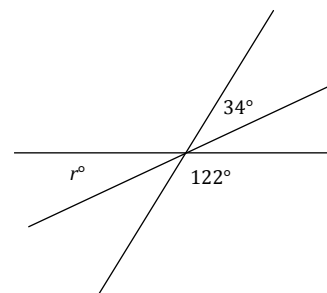
3. Two lines meet at the vertex of a ray. Set up and solve an equation to find the value of  $w$ .



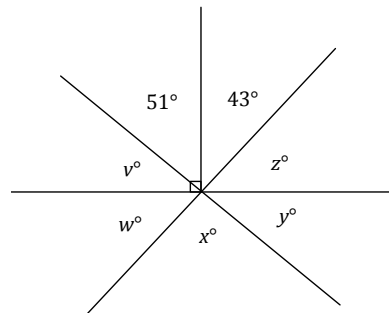
4. Two lines meet at the common vertex of two rays. Set up and solve an equation to find the value of  $m$ .



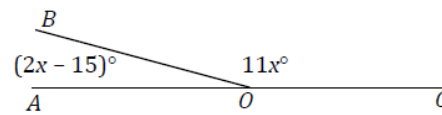
5. Three lines meet at a point. Set up and solve an equation to find the value of  $r$ .



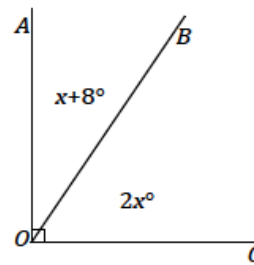
6. Three lines meet at the vertex of a ray. Set up and solve an equation to find the value of each variable in the diagram.



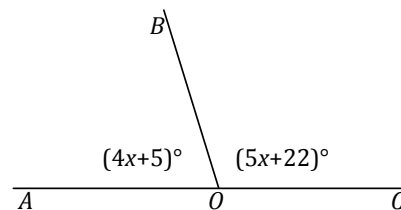
7. Set up and solve an equation to find the value of  $x$ . Find the measurement of  $\angle AOB$  and of  $\angle BOC$ .



8. Set up and solve an equation to find the value of  $x$ . Find the measurement of  $\angle AOB$  and of  $\angle BOC$ .



9. Set up and solve an equation to find the value of  $x$ . Find the measurement of  $\angle AOB$  and of  $\angle BOC$ .



10. Write a verbal problem that models the following diagram. Then solve for the two angles.

