

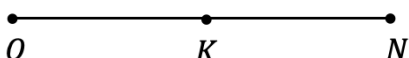
**Lesson 1.04 Angles & Intersecting Lines**

Students will be able to:

- Content Objective: Define vertical, complementary, and supplementary angles.
- Language Objective: Create a diagram and write an equation to solve for missing angles.


**Warm Up**

Given that  $k$  is the midpoint of  $\overline{ON}$ ,  $\overline{OK} = 4x - 2$  and  $\overline{ON} = 2x + \frac{1}{2}$ , solve for the length of  $\overline{ON}$  in inches. **Hint**: label the diagram with the given information.


**Vocabulary Review**

Match each of the following to the correct illustration.

1.  $\overline{CD}$

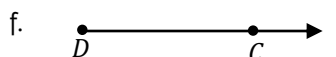
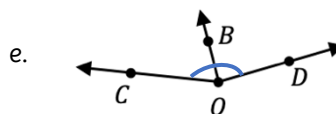
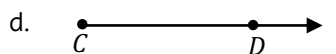
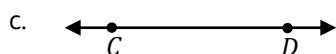
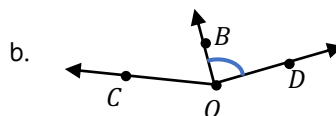
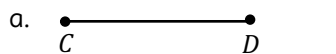
2.  $\overrightarrow{DC}$

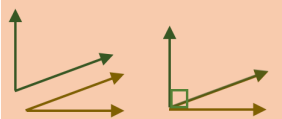
3.  $\overline{CD}$

4.  $\overrightarrow{DC}$

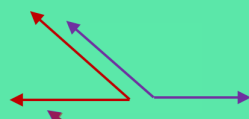
5.  $\angle COD$

6.  $\angle DOB$

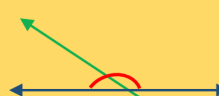

**Graphic Organizer**

 Two angles whose  
 measures add to  $90^\circ$ .

 Make a right angle when  
 adjacent (share a common  
 ray)

**Complementary  
 Angles**

 Two angles whose  
 measures add to  $180^\circ$ .

 Make a straight angle  
 when adjacent

**Supplementary  
 Angles**

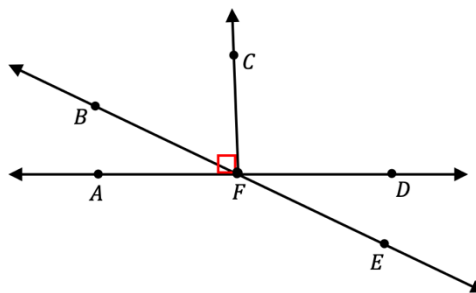
 A pair of adjacent angles  
 formed when two lines  
 intersect each other.

 Adjacent angles sum to  
 $180^\circ$  (supplementary)

**Linear  
 Pair**


**Skill 1: Identifying Angles**

Complete the following based on the diagram below.

- List one pair of complementary angles.
- List one pair of supplementary angles.
- Name a pair of adjacent angles.
- List two different linear pairs.



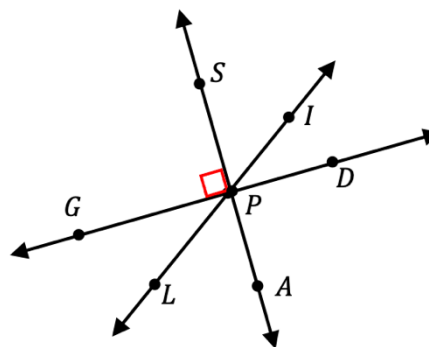
**Perpendicular Lines:** Lines that intersect to form  $90^\circ$  (right) angles. We represent perpendicular using the symbol " $\perp$ ".

*Example:* In the diagram from Skill 1,  $\overrightarrow{FC} \perp \overrightarrow{AD}$ .


**Exercise 1: Identifying Angles**

Complete the following based on the diagram below.

- What is the value of  $m\angle SPI + m\angle DPI$ ? What type of angles do these represent?
- List one pair of supplementary angles.
- What type of lines are  $\overrightarrow{SA}$  and  $\overrightarrow{GD}$ ?
- Find the measure of  $\angle APD$ .



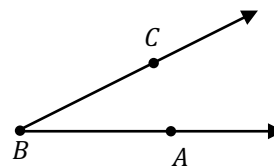
**Vertical Angles:** Congruent angles that are across from each other and are formed by two intersecting lines.

*Example:* In the diagram from Exercise 1,  $\angle GPS \cong \angle APD$ .


**Skill 2: Complementary & Supplementary Angles**

Complete the following.

- $\angle A$  is supplementary to  $\angle D$ . If  $m\angle A$  is 12 more than twice the measure of  $\angle D$ , find the measure of  $\angle A$ .
- Using a protractor measure  $\angle ABC$  then, construct  $\overrightarrow{BD}$  so that  $\angle DBC$  is complementary to  $\angle ABC$ .

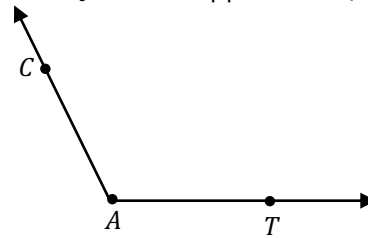




**Exercise 2: Complementary & Supplementary Angles**

Complete the following.

- a.  $\angle C$  is complementary to  $\angle B$ . If  $m\angle B$  is 6 less than three times the measure of  $\angle C$ , find the measure of  $\angle C$ .
- b. Using a protractor measure  $\angle CAT$  then construct  $\angle QRS$ , the supplement of  $\angle CAT$ .



**Write It Out**

Lines  $\overleftrightarrow{ME}$  and  $\overleftrightarrow{TO}$  intersect at point  $P$  where  $m\angle MPO = 5x - 1$  and  $m\angle TPE = 4x + 3$ .

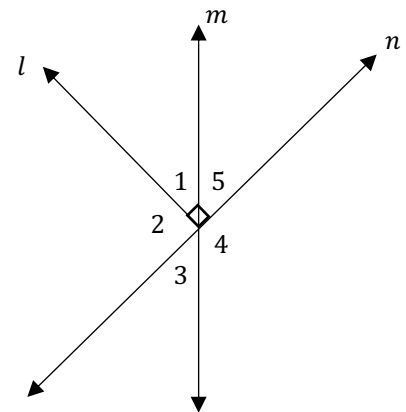
- a. Draw a diagram that represents the given information.
- b. What type of angles are  $\angle MPO$  and  $\angle TPE$ ? What can you conclude based on this information?
- c. Set up an equation and solve for the value of  $x$ .
- d. Find the measure of  $\angle MPO$  and  $\angle TPE$ .



**Check Point**

Use the diagram below to complete the following.

- a. List one pair of complementary angles.
- b. List one pair of supplementary angles.
- c. List one pair of vertical angles.
- d. What two lines are perpendicular?
- e. The ratio of the measures of  $\angle 3$  to  $\angle 4$ , is 2:7. What is the measure of the smaller angle?

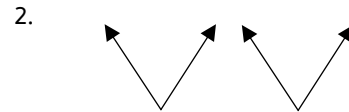
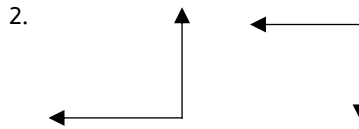
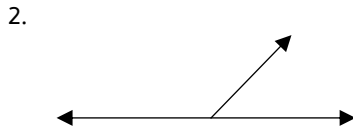
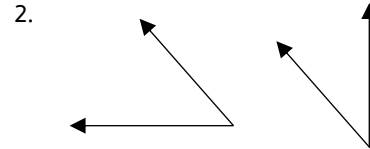
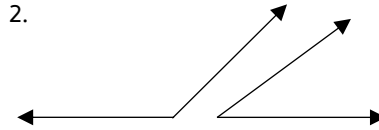
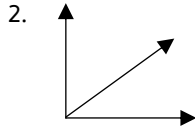




Problem Set

Name: \_\_\_\_\_

1. Using a protractor, identify whether each pair of angles shown below are complementary, supplementary, or neither.



2. Lines  $\overleftrightarrow{OR}$  and  $\overleftrightarrow{BE}$  intersect at point  $M$  where  $m\angle OMB = 2y + 24$  and  $m\angle EMR = 5y$ .
- Draw a diagram that represents the given information.
  - Set up an equation and solve for the value of  $y$ .
- c. Find the measure of  $\angle OMB$  and  $\angle EMR$ .

3. Given the diagram below, not drawn to scale,  $m\angle 1 = x - 6$  and  $m\angle 2 = 4x + 4$  and  $m\angle 3 = 2x$ . Using this information, find the measure of  $\angle 6$ . **Show all work that leads to your answer.**

