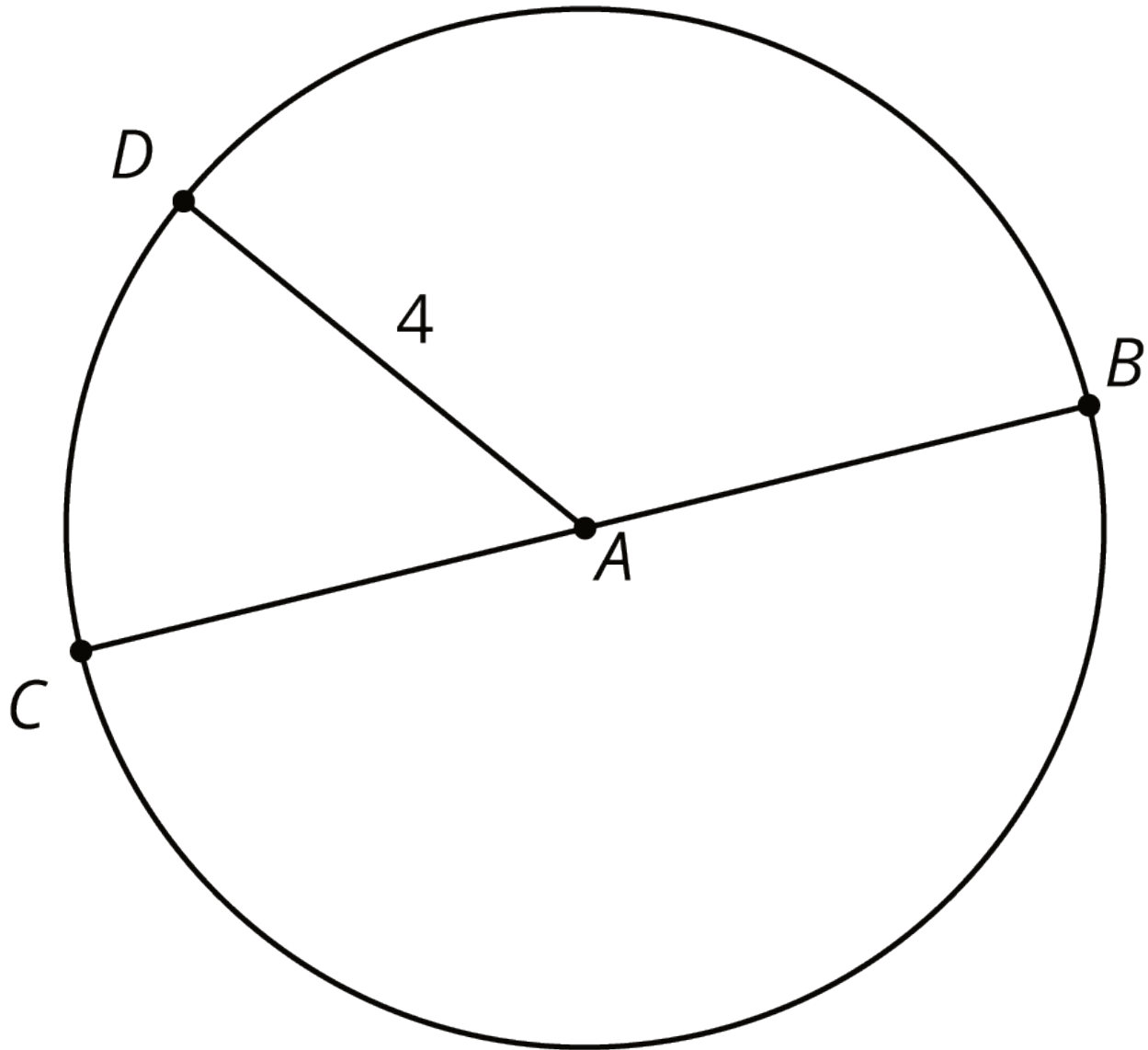


## Unit 5 Lesson 13: The Volume of a Cylinder

### 1 A Circle's Dimensions (Warm up)

Student Task Statement



Here is a circle. Points  $A$ ,  $B$ ,  $C$ , and  $D$  are drawn, as well as Segments  $AD$  and  $BC$ .

1. What is the area of the circle, in square units? Select all that apply.
  - a.  $4\pi$
  - b.  $\pi 8$
  - c.  $16\pi$
  - d.  $\pi 4^2$

e. approximately 25

f. approximately 50

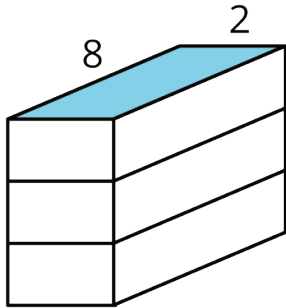
2. If the area of a circle is  $49\pi$  square units, what is its radius? Explain your reasoning.

## 2 Circular Volumes

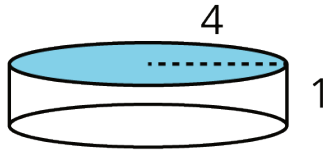
### Student Task Statement

What is the volume of each figure, in cubic units? Even if you aren't sure, make a reasonable guess.

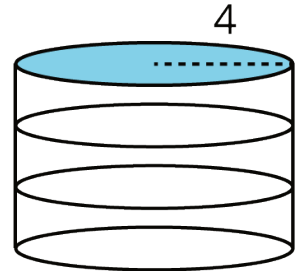
A



B



C

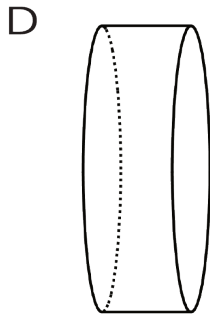
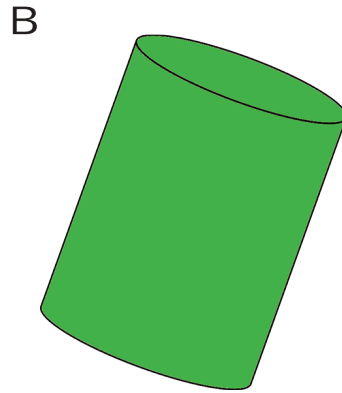
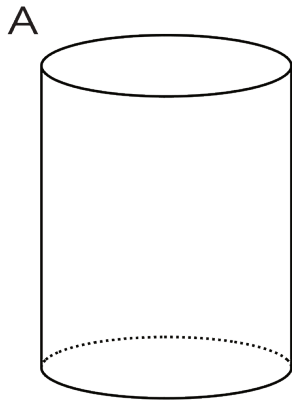


1. Figure A: A rectangular prism whose base has an area of 16 square units and whose height is 3 units.
2. Figure B: A cylinder whose base has an area of  $16\pi$  square units and whose height is 1 unit.
3. Figure C: A cylinder whose base has an area of  $16\pi$  square units and whose height is 3 units.

### 3 A Cylinder's Dimensions (Optional)

#### Student Task Statement

1. For cylinders A-D, sketch a radius and the height. Label the radius with an  $r$  and the height with an  $h$ .

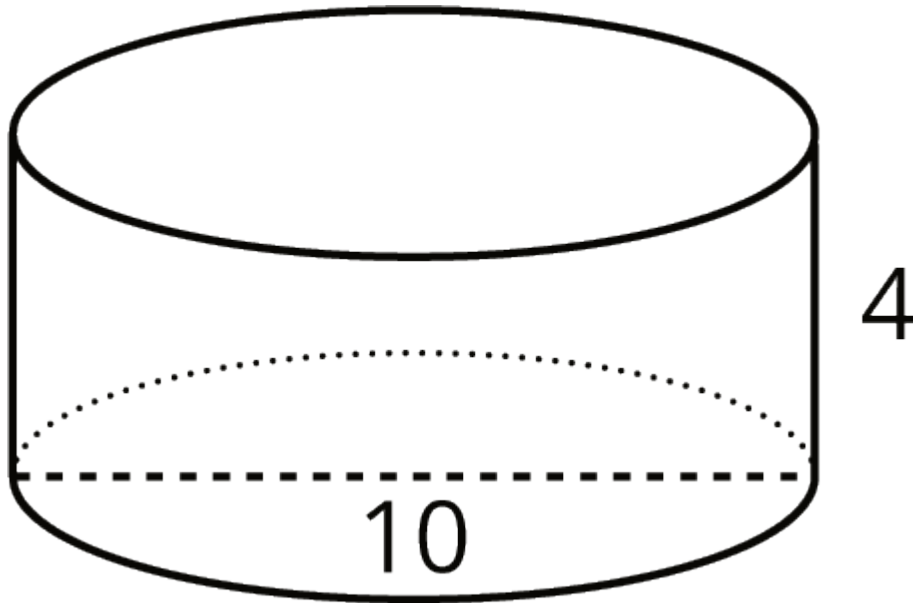


2. Earlier you learned how to sketch a cylinder. Sketch cylinders for E and F and label each one's radius and height.

## 4 A Cylinder's Volume

### Student Task Statement

1. Here is a cylinder with height 4 units and diameter 10 units.



- a. Shade the cylinder's base.
  - b. What is the area of the cylinder's base? Express your answer in terms of  $\pi$ .
  - c. What is the volume of this cylinder? Express your answer in terms of  $\pi$ .
2. A silo is a cylindrical container that is used on farms to hold large amounts of goods, such as grain. On a particular farm, a silo has a height of 18 feet and diameter of 6 feet. Make a sketch of this silo and label its height and radius. How many cubic feet of grain can this silo hold? Use 3.14 as an approximation for  $\pi$ .