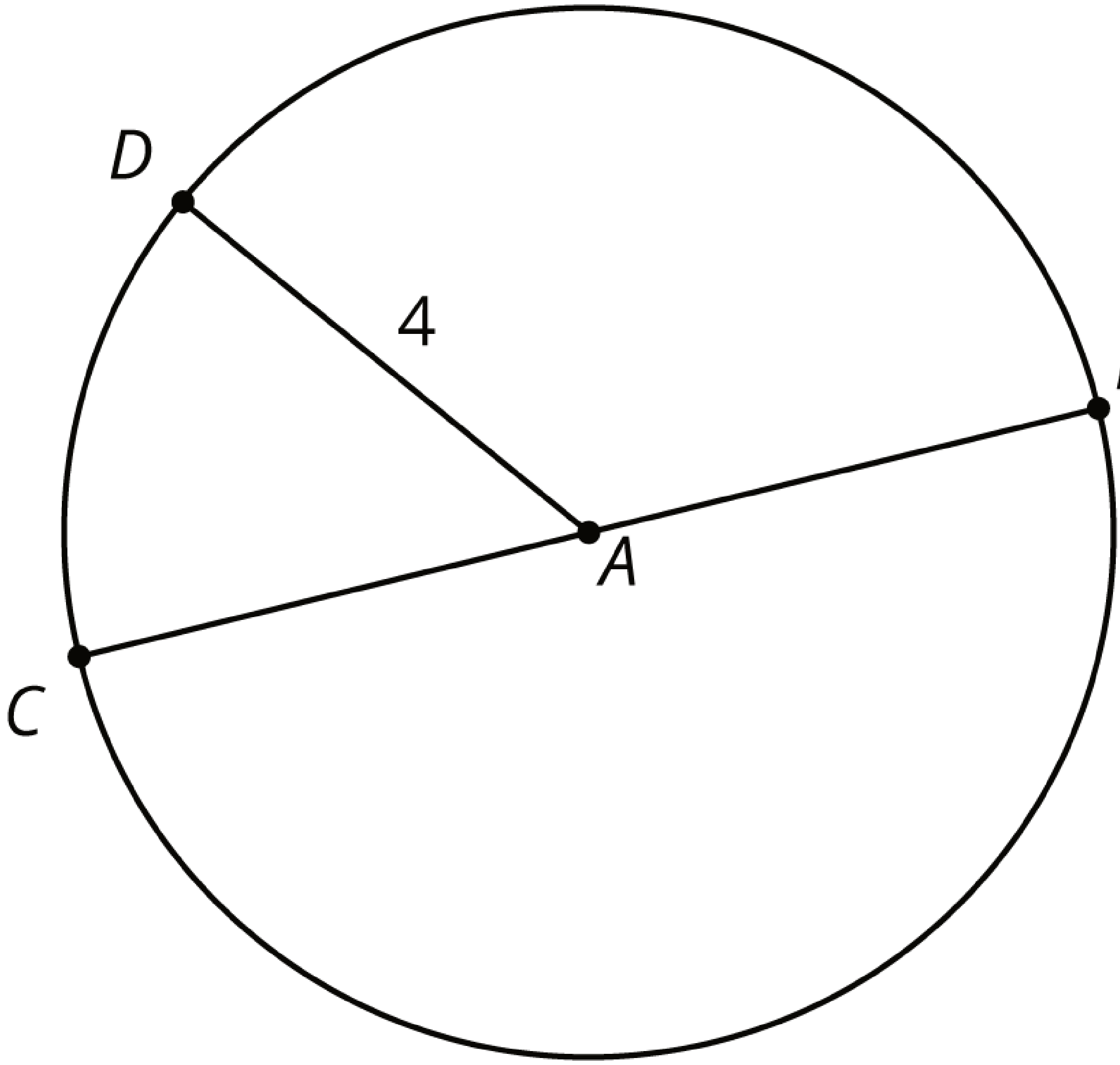
Unit 6 Lesson 18: The Volume and Dimensions of a Cylinder

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. 4π

    b. $\pi 8$

    c. 16π

d. $\pi 4^2$

e. approximately 25

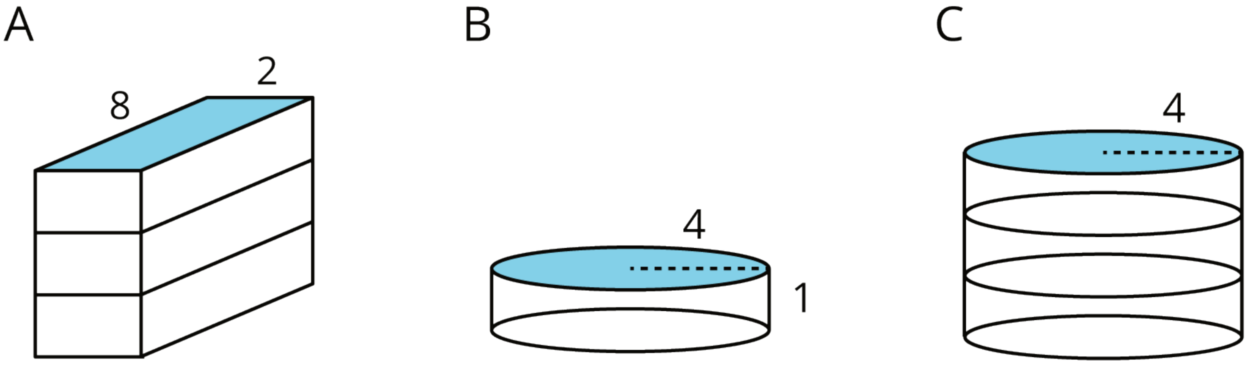
f. approximately 50

2. If the area of a circle is 49π 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.



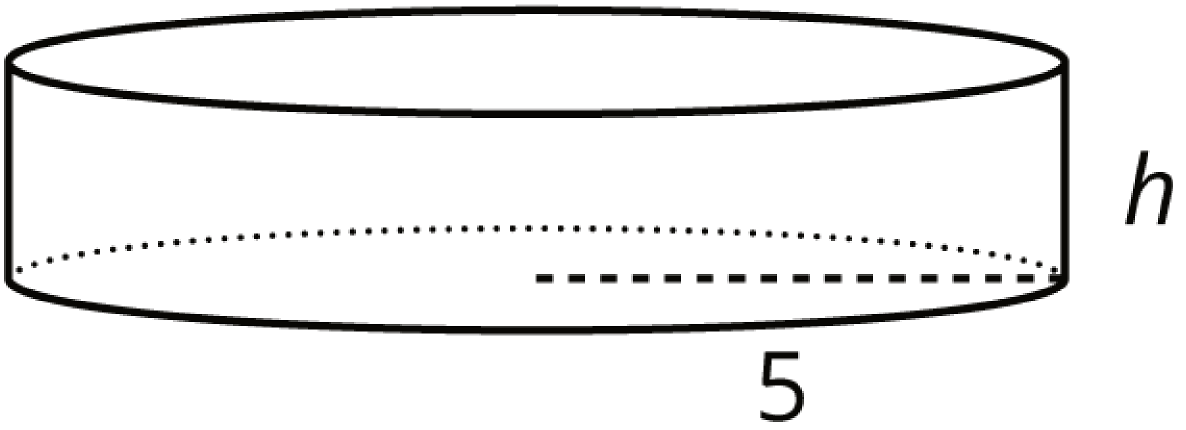
1. Figure A: A rectangular prism whose base has an area of 16 square units and whose height is 3 units.
2. Figure B: A cylinder whose base has an area of 16π square units and whose height is 1 unit.
3. Figure C: A cylinder whose base has an area of 16π square units and whose height is 3 units.

3 What’s the Dimension?

Student Task Statement

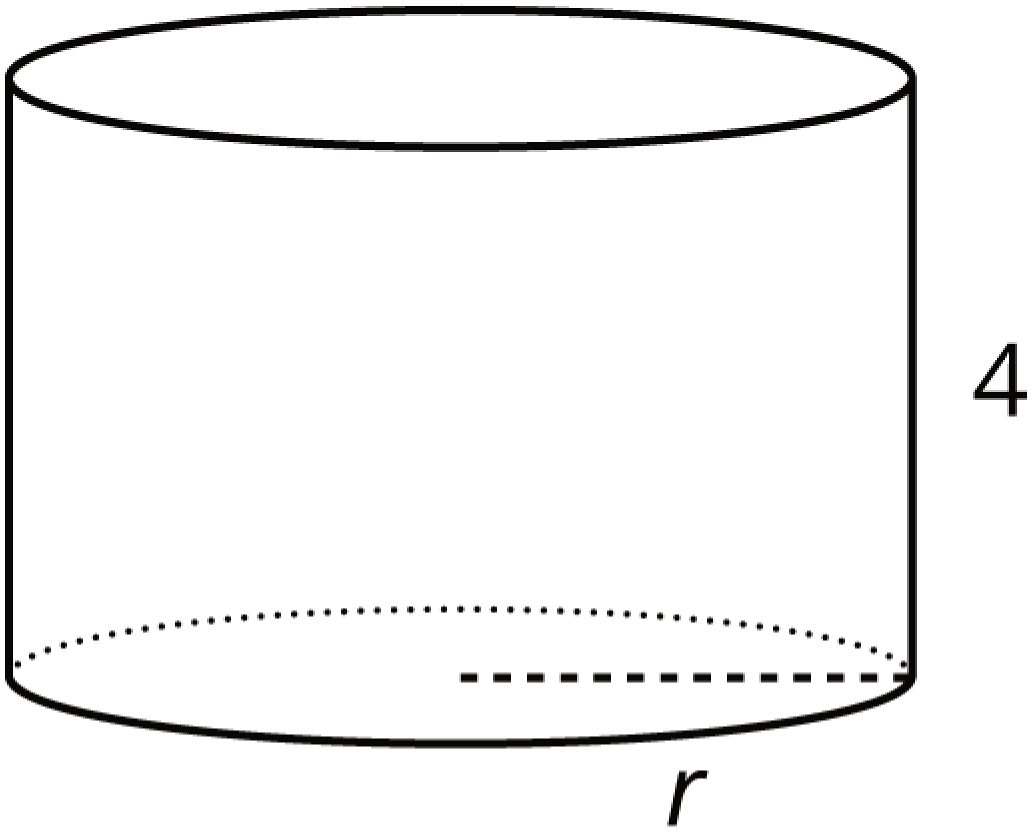
The volume V of a cylinder with radius r is given by the formula $V = \pi r^2 h$.

1. The volume of this cylinder with radius 5 units is 50π cubic units. This statement is true: $50\pi = 5^2 \pi h$



What does the height of this cylinder have to be? Explain how you know.

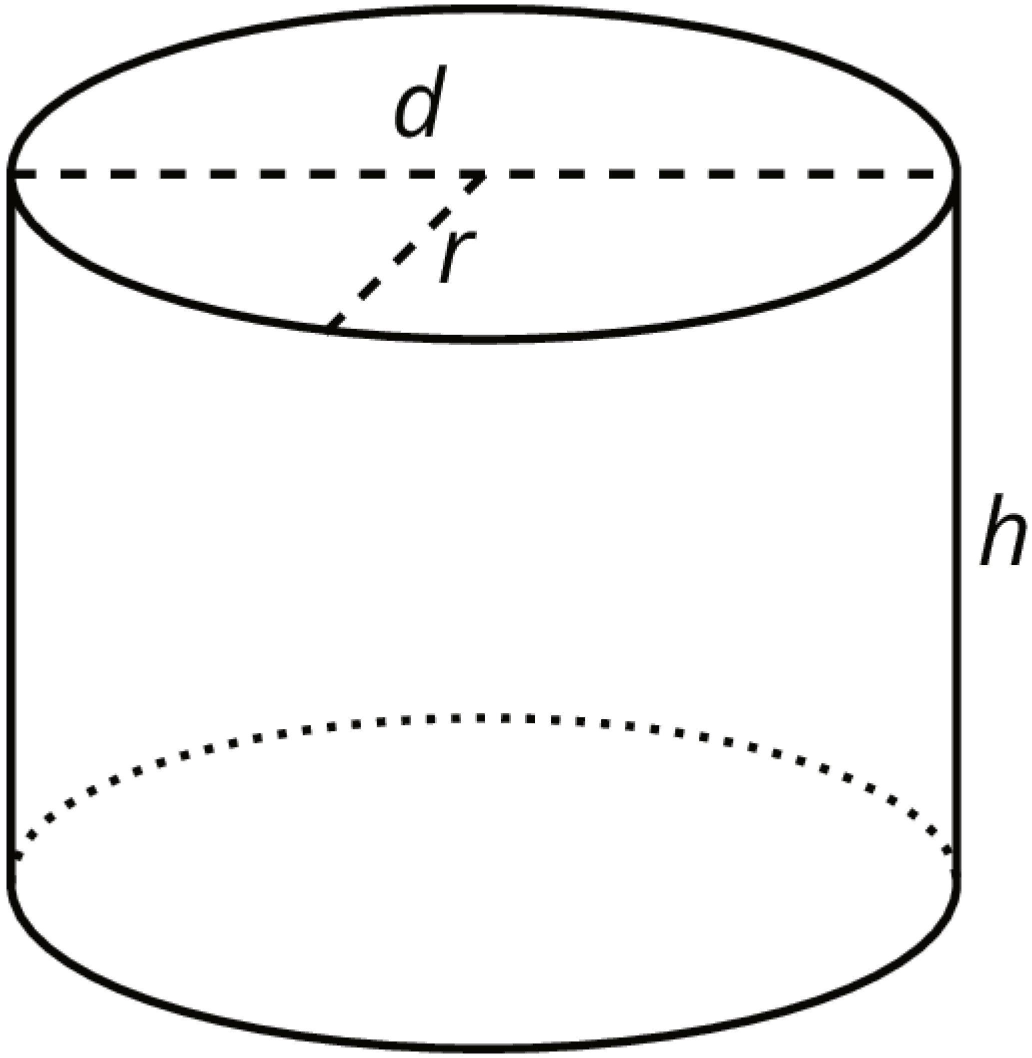
2. The volume of this cylinder with height 4 units is 36π cubic units. This statement is true: $36\pi = r^2 \pi 4$



What does the radius of this cylinder have to be? Explain how you know.

4 Cylinders with Unknown Dimensions

Student Task Statement



Each row of the table has information about a particular cylinder. Complete the table with the missing dimensions.

diameter (units)	radius (units)	area of the base (square units)	height (units)	volume (cubic units)
	3		5	
12				108π
			11	99π
8				16π
			100	16π
	10			20π
20				314
			b	$\pi \cdot b \cdot a^2$