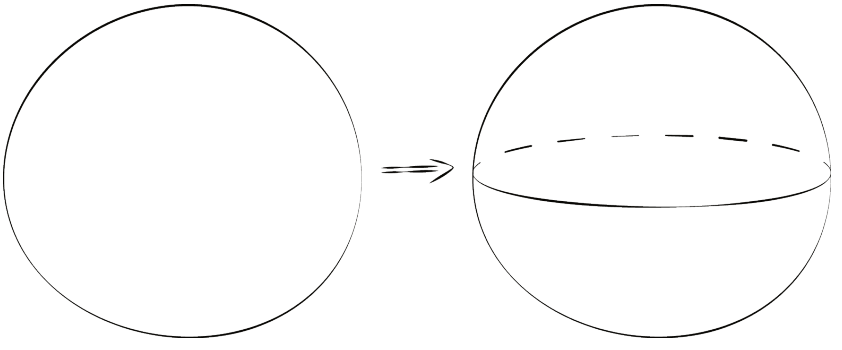
Unit 5 Lesson 20: The Volume of a Sphere

1 Sketch a Sphere (Warm up)

Student Task Statement

Here is a method for quickly sketching a sphere:

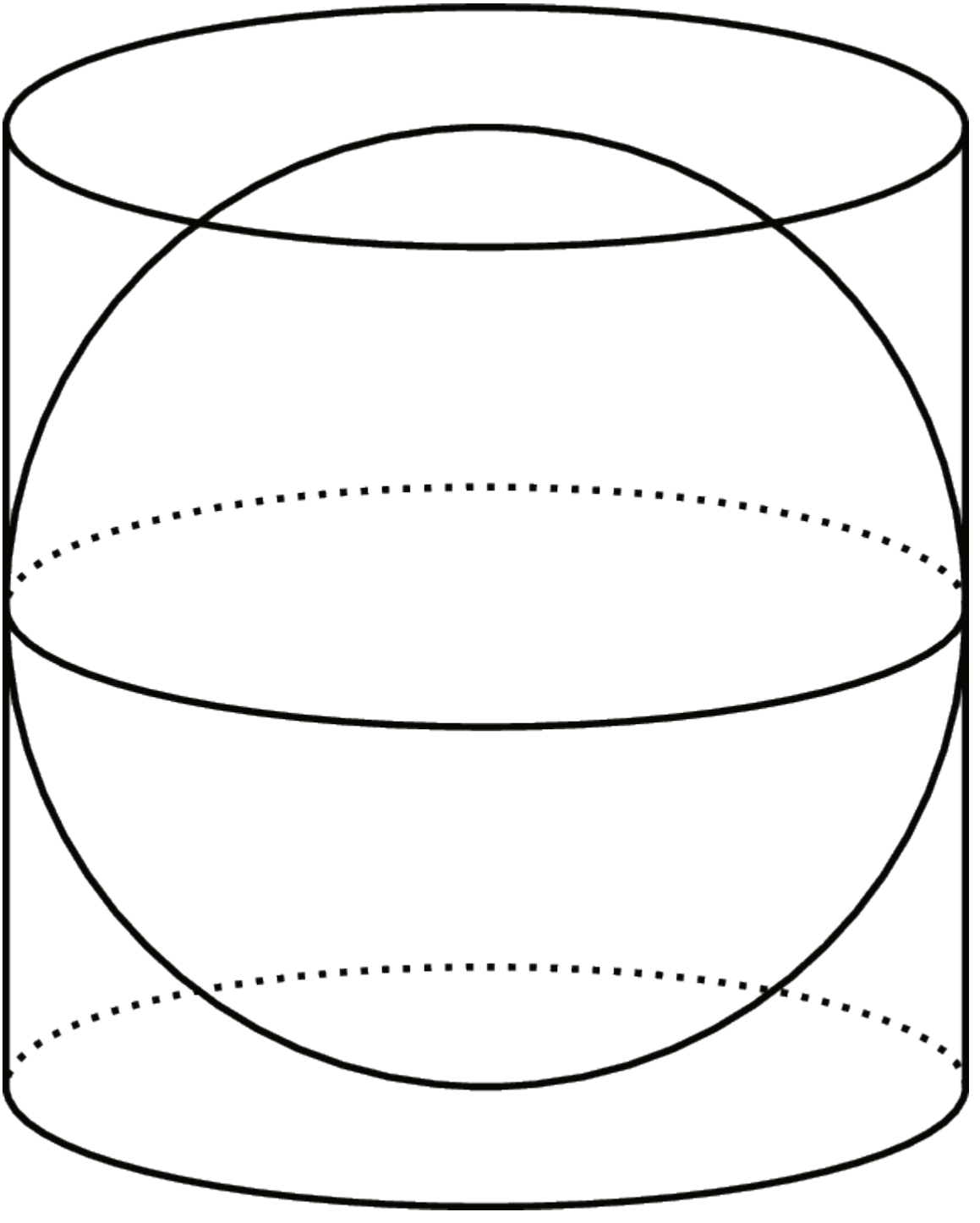
- Draw a circle.
- Draw an oval in the middle whose edges touch the sphere.



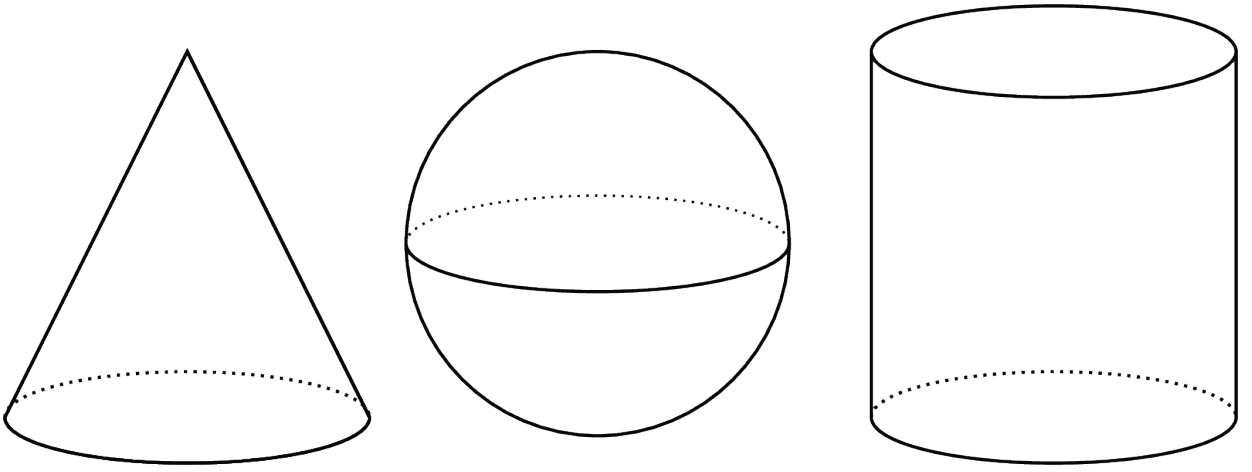
1. Practice sketching some spheres. Sketch a few different sizes.
2. For each sketch, draw a radius and label it r.

2 A Sphere in a Cylinder

Images for Launch



Student Task Statement

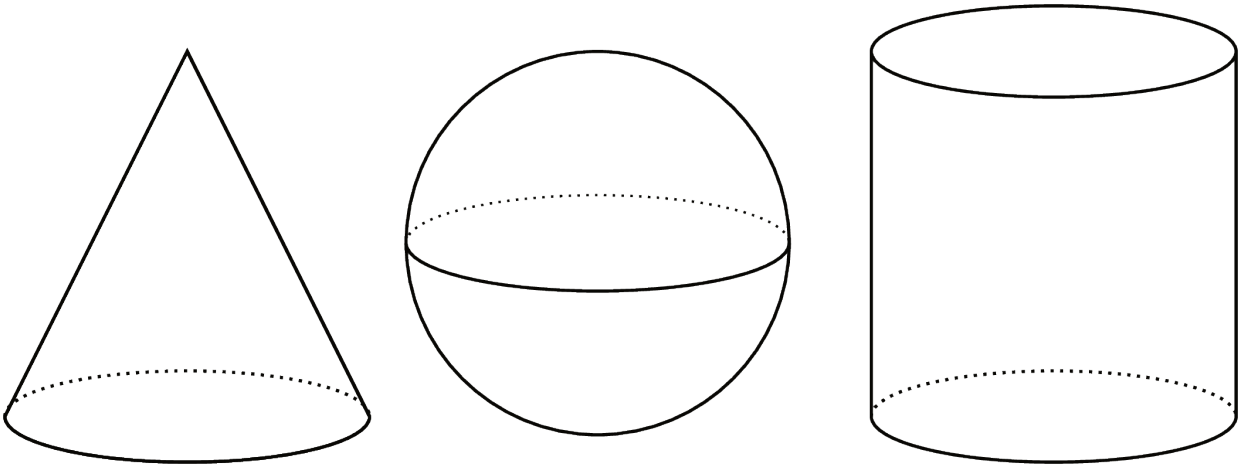


Here are a cone, a sphere, and a cylinder that all have the same radii and heights. The radius of the cylinder is 5 units. When necessary, express all answers in terms of π.

1. What is the height of the cylinder?
2. What is the volume of the cylinder?
3. What is the volume of the cone?
4. What is the volume of the sphere? Explain your reasoning.

3 Spheres in Cylinders

Student Task Statement



Here are a cone, a sphere, and a cylinder that all have the same radii and heights. Let the radius of the cylinder be r units. When necessary, express answers in terms of π.

1. What is the height of the cylinder in terms of r?
2. What is the volume of the cylinder in terms of r?
3. What is the volume of the cone in terms of r?
4. What is the volume of the sphere in terms of r?
5. A volume of the cone is $\frac{1}{3}$ the volume of a cylinder. The volume of the sphere is what fraction of the volume of the cylinder?