

Worksheet 9 - Cylindrical and Spherical Coordinates

1. Find the volume of a sphere of radius a using the following coordinate systems.

- (a) Find the volume using Cartesian coordinates.
- (b) Find the volume using cylindrical coordinates.
- (c) Find the volume using spherical coordinates.

2. Find the volume of a more complicated shape.

Consider the following solid shape. Imagine that a sphere of radius 2 has been superimposed upon a cylinder with radius 1 and height 12 units. Find the volume of this shape using cylindrical and spherical coordinates. Note: Do not count any of the volume twice!

