

Exercise 9.3:

Specify bounding volumes in the form of a box and a sphere for the object in figure 9.3. The cylinder has a radius of one unit and a height of three units. The cone is two units high.

Solution (sketch):

Bounding volume in the form of a box: Height 5, width and depth 2.

Bounding volume in the form of a sphere: Sphere with centre at height 2.5 in the middle of the cylinder with radius

$$r = \max\{2.5, \sqrt{1 + 2.5^2}\} \approx 2.7.$$

When the radius should be minimal, the centre of the sphere should be placed at height 2.4 with radius $r = 2.6$.