

Instructions: (10 points total) Show all work for credit. You may use your book, but no other resource.

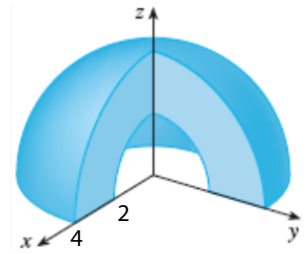
1. (5 pts.) Consider the solid E which, in cylindrical coordinates, is bounded by the planes $z = 0$, $z = r \sin(\theta) + 5$ and the cylinders $r = 1$ and $r = 5$

(a) Sketch (as best you can) the solid E .

(b) Compute the definite integral $\iiint_E x - y \, dV$

2. (5 pts.) Pictured is a solid B that fills up three-quarters of the region between hemispheres of radius 2 and one of radius 4.

(a) Without doing any calculus at all, compute the volume of the solid B . (You may look up the volume of a sphere if you do not remember it.)



- (b) Now use spherical coordinates and an appropriate triple integral to compute this volume.