

# List of suggested exercises, Sections 8.1-2 (and a bit of 5.2) For the DGD of May 22th and 24th

(1) Find the area between the following curves:

(i)  $3x + y = 6$     $y = x^2 - 4$     $x = 0$ .

(ii)  $2y^2 = x + 2$     $y^2 + x = y + 2$ .

(iii)  $x = y^3 - y$     $x = 1 - y^4$ .

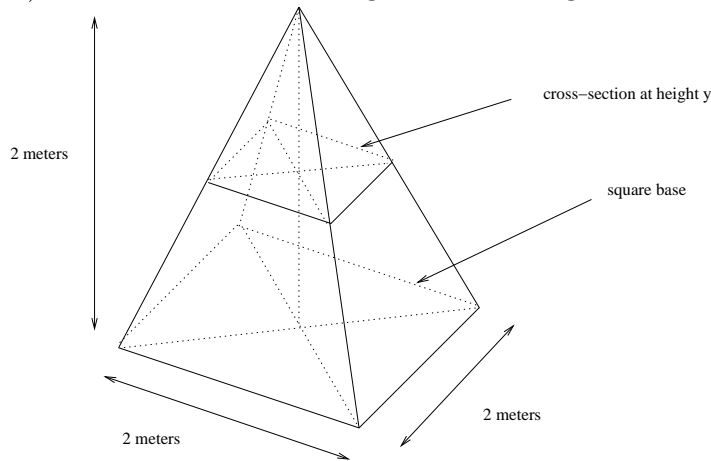
(iv)  $y = 4x^2$     $y = x^2 + 3$

(v)  $y = x$     $y = \sin(x)$     $x = -\frac{\pi}{4}$     $x = \frac{\pi}{2}$ .

(vi)  $y = \cos(x)$     $y = \sin(2x)$     $x = 0$     $x = \frac{\pi}{2}$ .

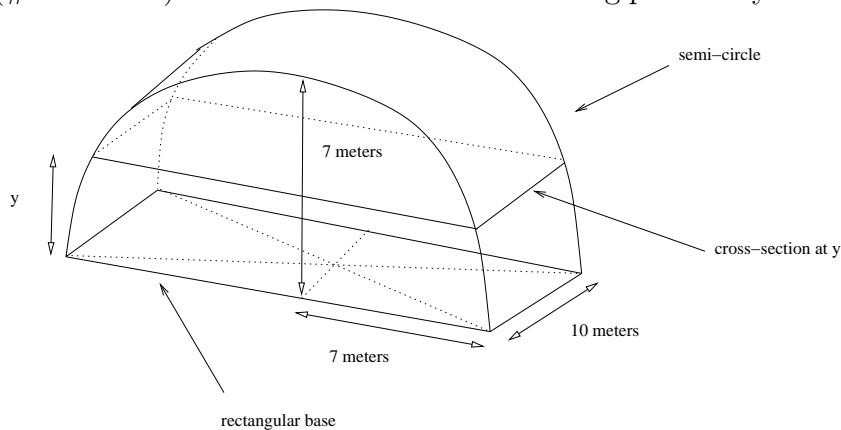
(vii)  $y = |x|$     $y = (x + 1)^2 - 7$     $x = -4$ .

(2) (#14 Sec 8.1) Find the volume of a right cone of height 2 meters with base a square of side



2 meters:

(3) (#12 Sec 8.1) Find the volume of the following piece of cylinder, using the given cross-section:



(4) (#25 Sec. 8.1) Find the volume of a sphere of radius  $r$  by slicing.

(5) Consider the region delimited by  $x - 3 = (y - 1)^2$  and  $x = 5 - 2y$ . Compute the volume of the solid generated by rotating the region around:

1. the  $y$ -axis;
  2. the line  $x = 8$ .
- (6) Consider the region bounded by the curves  $y = x$  and  $y = x^2$ . Find the volume of the solid generated by rotating the region around
1. the  $x$ -axis;
  2. the line  $y = 5$ ;
  3. the line  $x = 2$ .
- (7) Consider the region bounded by the curves  $y = x^4$  and  $x = y^4$ . Find the volume of the solid generated by rotating the region around
1. the  $x$ -axis;
  2. the  $y$ -axis;
  3. the line  $y = 1$ ;
  4. the line  $x = -1$ .
- (8) Consider the region bounded by the curves  $y = \sin(x)$ ,  $x = \pi/2$  and the  $x$ -axis. Find the volume of the solid generated by rotating the region around
1. the  $x$ -axis;
  2. the  $y$ -axis;
  3. the line  $y = 1$ ;
  4. the line  $x = 2$ .