

## AP CALCULUS AB

### Practice Problems – Areas and Volumes

1. Find the area between the curves  $f(x) = x^2 + 2x + 1$  and  $g(x) = 2x + 5$ .
2. Find the area between the curves  $f(x) = x(x^2 - 3x + 3)$  and  $g(x) = x^2$ .
3. Find the area of the region bounded by  $y = x^4 - 2x^2$ ;  $y = 2x^2$ ;  $x = 1$  and  $x = 2$ .
4. Find the area between  $f(x) = 2 \sin x$  and  $g(x) = \tan x$  for  $-\pi/3 < x < \pi/3$ .
5. Find the volume of the solid created by revolving the region in the first quadrant bounded by  $y = 4 - x^2$ ;  $x = 0$  and  $y = 0$  about the  $x$ -axis.
6. Find the volume of the solid created by revolving the region bounded by  $y = 4 - x^2/4$  and  $y = 2$  (in the first and second quadrants) about the  $x$ -axis.
7. Find the volume of the solid created by revolving the region in the first quadrant bounded by  $y = x^{2/3}$ ;  $y = 1$  and  $x = 0$  about the  $y$ -axis.
8. Find the volume of the solid created by revolving the region bounded by  $y = 6 - 2x - x^2$  and  $y = x + 6$  about the line  $y = 3$ .
9. The region  $R$  is bounded by  $y = \frac{1}{2}x^2$ ;  $y = 0$  and  $x = 6$ .  $R$  is the base of a solid whose cross sections are perpendicular to the  $x$ -axis. Find the volume of this solid if its cross sections are (a) squares and (b) semi-circles.
10. The region  $R$  is bounded by  $y = \sqrt{x}$ ;  $y = 0$  and  $x = 4$ .  $R$  is the base of a solid whose cross sections are perpendicular to the  $x$ -axis. Find the volume of this solid if its cross sections are (a) rectangles with a height of 10 and (b) equilateral triangles.

## Calculus ch. 6- volume—disk or washer method

You may use a calculator, but you must set up the integral the correct way.- sketch

The region bounded by

$y=e^x-1$ ,  $x=3$  and the  $x$ -axis and  $y$ -axis

Find the volume when the region is revolved about

1) The  $x$  axis

2) The  $y$ -axis

3) The line  $x=3$

4) The line  $y=25$