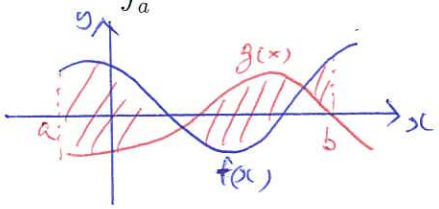
MA1201, CH1, Review for Test II (2015, SemB)

Chapter 3

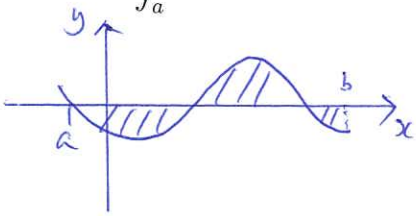
1. (p. 4-20) Area of the region bounded by the curves $y = f(x)$ and $y = g(x)$:

$$Area = \int_a^b |f(x) - g(x)|dx.$$



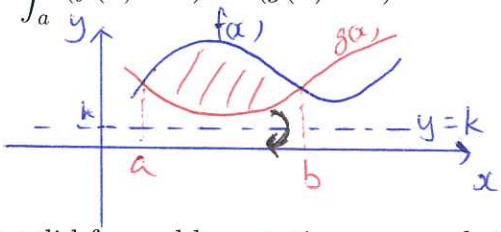
If the area enclosed by the curves $y = f(x)$ and x-axis (g(x)=0):

$$Area = \int_a^b |f(x)|dx.$$



2. (p. 21-25, 37) Volume of the solid formed by rotating an area between $y = f(x)$ and $y = g(x)$ about $y = k$ ($f(x) > g(x)$ and $y = k$ not cut the region):

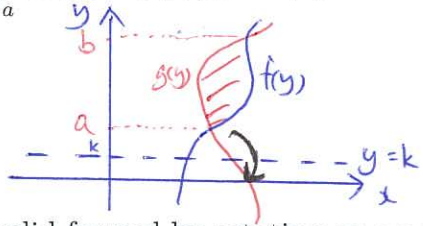
$$V_x = \pi \int_a^b (f(x) - k)^2 - (g(x) - k)^2 dx.$$



$f(x) \geq g(x)$ in $[a, b]$

(shell method) Volume of the solid formed by rotating an area between $x = f(y)$ and $x = g(y)$ about $y = k$ ($f(y) > g(y)$ and $y = k$ not cut the region):

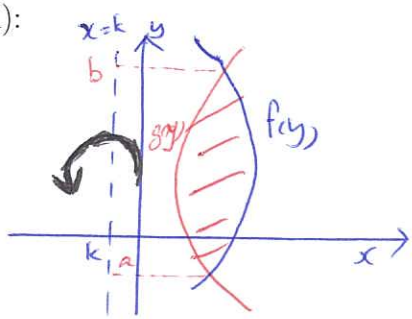
$$V_x = 2\pi \int_a^b (f(y) - g(y))|y - k|dy.$$



$f(y) \geq g(y)$ in $[a, b]$

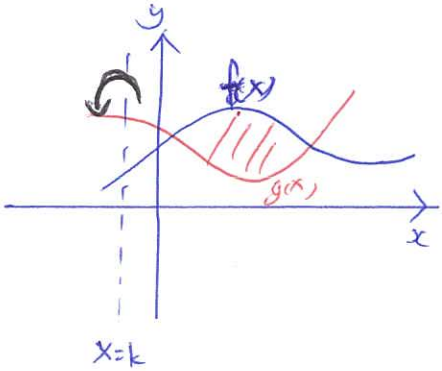
2.5. (p. 21-25, 37) Volume of the solid formed by rotating an area between $x = f(y)$ and $x = g(y)$ about $x = k$ ($f(y) > g(y)$ and $x = k$ not cut the region):

$$V_y = \pi \int_a^b (f(y) - k)^2 - (g(y) - k)^2 dy.$$



(shell method) Volume of the solid formed by rotating an area between $y = f(x)$ and $y = g(x)$ about $y = k$ ($f(x) > g(x)$ and $x = k$ not cut the region):

$$V_y = 2\pi \int_a^b (f(x) - g(x))|x - k|dx.$$



3. (p.44-46) Arc length of a curve $y = f(x)$:

$$L = \int_a^b \sqrt{1 + [f'(x)]^2}dx$$

4. (p. 39-62) Area of surface generated by rotating $y = f(x)$ about $y = k$ ($f(x) > k$):

$$A = 2\pi \int_a^b (f(x) - k)\sqrt{1 + [f'(x)]^2}dx.$$

5. (p.63-78) Problems in parametric equations (see table on p.77-78).

Important questions in problem set 3: 1, 2, 4, 5, 6, 9.