Calculus   Volumes – Disks and Shells
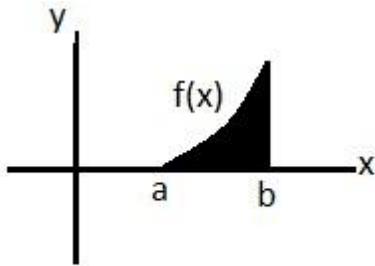
I. Disk Method
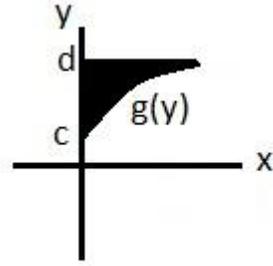
   A. Use Disk Method if

   (1) the function is in terms of x and rotation is about the x-axis or

   (2) the function is in terms of y and rotation is about the y-axis

   B. About the x-axis: $\displaystyle\int_a^b \pi\big(f(x)\big)^2\, dx$

   About the y-axis: $\displaystyle\int_c^d \pi\big(g(y)\big)^2\, dy$
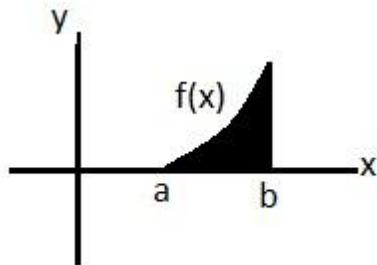

II. Shell Method

   A. Use Shell Method if

   (1) the function is in terms of x and rotation is about the y-axis or

   (2) the function is in terms of y and rotation is about the x-axis

   B. About the y-axis: $\displaystyle\int_a^b 2\pi x\big(f(x)\big)\, dx$

   About the x-axis: $\displaystyle\int_c^d 2\pi y\big(g(y)\big)\, dy$