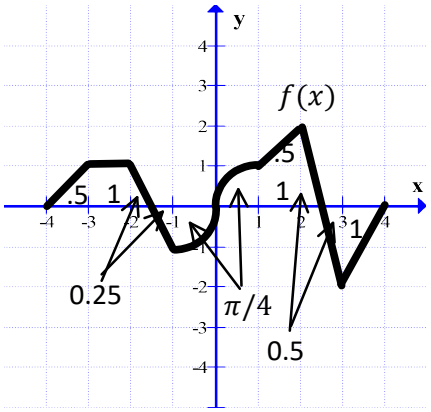
C12 - 5.4 - Int Info/Graph/Rules/Solids Notes



A function $f(x)$ consists of straight lines and quarter circles.

$$\int_0^2 f(x)\,dx = \frac{\pi}{4} + 1 + 0.5 = 2.29$$

$$\int_{-4}^0 f(x)\,dx = 0.5 + 1 + 0.25 - 0.25 - \frac{\pi}{4} = 0.71$$

$$\int_2^3 f(x+1)\,dx = \int_3^4 f(x)\,dx = -1 \quad HT = -1$$

Draw it!

$$\int_2^4 f(2x)\,dx = \int_1^2 f(x)\,dx = 1 + 1 + 1 = 3 \quad HC = \frac{1}{2}$$

Given :

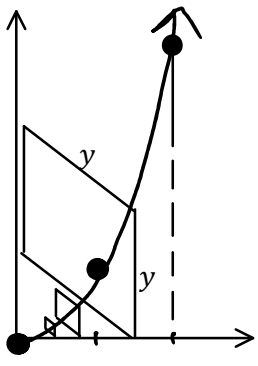
$$\int_0^2 f(x)\,dx = 2 \quad \int_2^3 f(y)\,dy = -1 \quad \int_3^0 g(x)\,dx = 4$$

Find :

$$\int_2^0 f(x)\,dx = -2 \quad \int_1^1 \frac{1}{2} f^2(x)\,dx = 0 \quad \int_0^3 f(x)\,dx = 2 + -1 = 1$$

$$\int_0^3 (f(x) + 2g(x))\,dx = 1 + 2(-4) = -7$$

The base of a solid is the region enclosed by the graph $y = x^2, the\ x-axis, the\ y-axis, and\ x = 2$. Each cross section perpendicular to the $x-axis$ is a square. Find the volume of the solid.



$$V = \int_0^2 y^2\,dy \qquad \boxed{\begin{matrix} A = lw \\ A = y^2 \end{matrix}}$$

$$= \int_0^2 (x^2)^2\,dx$$

$$= \int_0^2 x^4\,dx$$

$$= \frac{x^5}{5}\Big|_0^2$$

$$= \frac{2^5}{5} - \frac{0^5}{5} = \frac{32}{5}$$