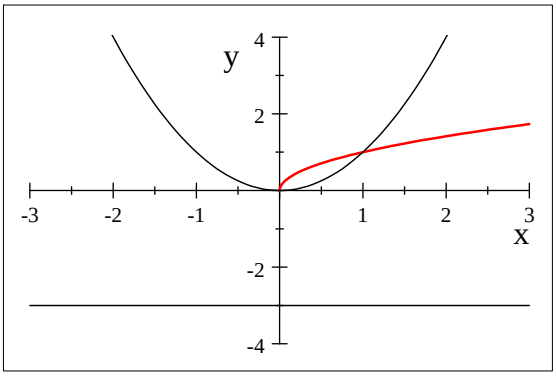
Math 152 Quiz 2 Print Name 2 pm or 3 pm

Set up the integrals ONLY.

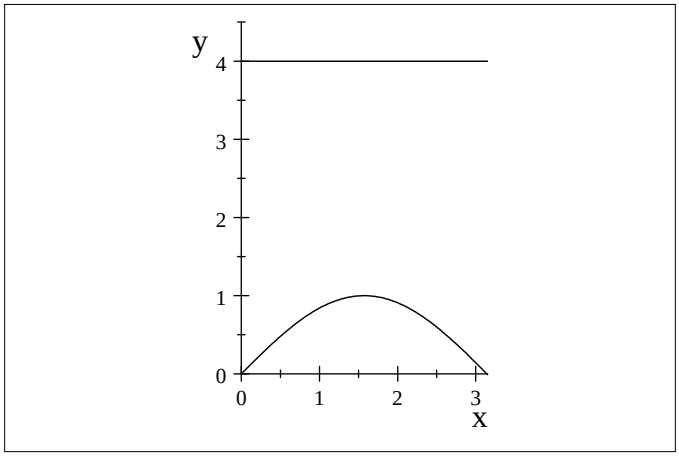
1. If $f(x) = \sqrt{x},\ x \in [0,1];\ g(x) = x^2,\ x \in [0,1]$. Find the volume resulted by rotating the area bounded by $y = f(x)$ and $y = g(x)$ around the $y = -3$ by using both Disc and Shell Methods.



a. Disc Method: $\pi \int_0^1 \left[(\sqrt{x} + 3)^2 - (x^2 + 3)^2 \right] dx$

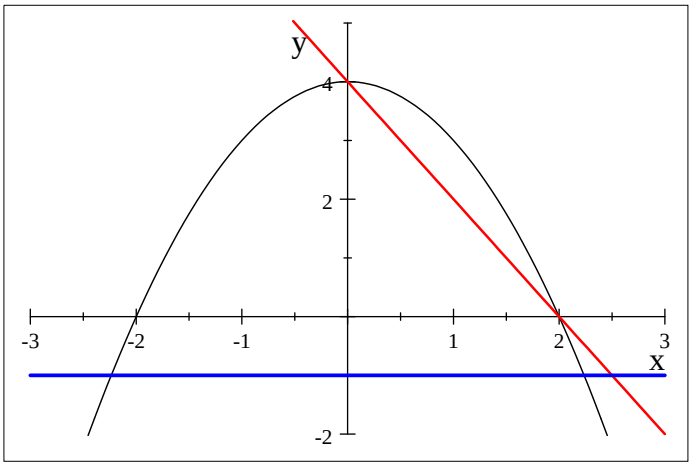
b. Shell Method: $2\pi \int_0^1 (y+3)\left(\sqrt{y} - y^2\right) dy = \frac{23}{10}\pi$

2. Find the volume resulted by rotating the area bounded by $y = \sin x$, $x \in [0, \pi]$ along $y = 4.\ \sin x$



Disc Method: $\pi \int_0^{\pi} \left[4^2 - (4 - \sin x)^2 \right] dx = \pi(16 - \frac{\pi}{2})$.

3. Find the volume resulted by rotating the area bounded by $y = 4 - x^2$ and $y = -2x + 4$ about $y = -1$ by using both Disc and Shell Methods.



a. Disc Method: $\pi\int_0^2\left[(4-x^2+1)^2-(-2x+4+1)^2\right]dx=\frac{136\pi}{15}$

b. Shell Method: $2\pi\int_0^4(y+1)\left(\sqrt{4-y}-\left(\frac{4-y}{2}\right)\right)dy=\frac{136\pi}{15}$