

Math 172 - Quiz 6

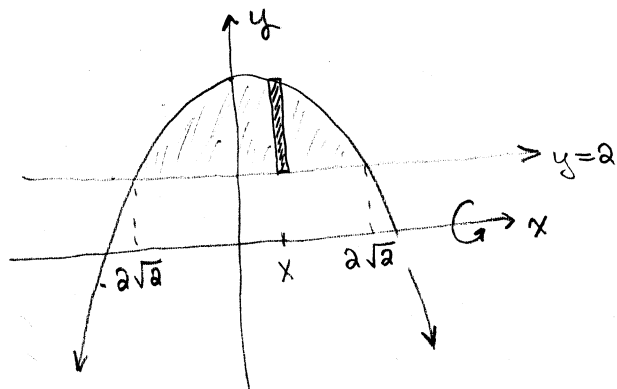
October 5, 2016

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. Set up the definite integral required for each problem. Then use your calculator to approximate its value.

1. (5 points) The region bounded by the graphs of $y = 4 - \frac{x^2}{4}$ and $y = 2$ is rotated about the x -axis to generate a solid. Find the volume of the solid.

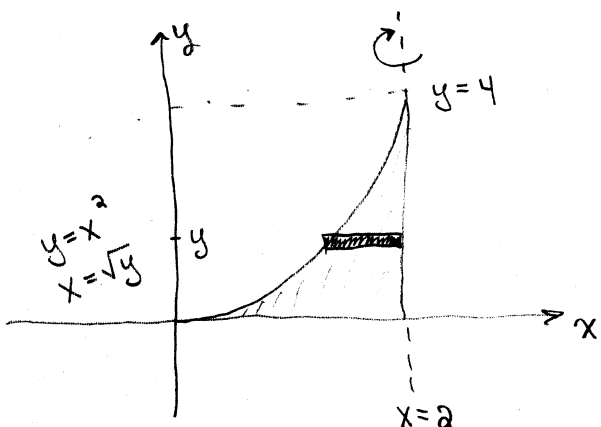


$$4 - \frac{x^2}{4} = 2 \Rightarrow \frac{x^2}{4} = 2 \Rightarrow x^2 = 8 \Rightarrow x = \pm 2\sqrt{2}$$

$$\pi \int_{-2\sqrt{2}}^{2\sqrt{2}} \left[\left(4 - \frac{x^2}{4}\right)^2 - (2)^2 \right] dx = \frac{448\sqrt{2}\pi}{15}$$

$$\approx 132.69$$

2. (5 points) The region bounded by the graphs of $y = x^2$, $y = 0$, and $x = 2$ is rotated about the line $x = 2$ to form a solid. Find the volume of the solid.



$$\pi \int_0^4 (2 - \sqrt{y})^2 dy = \frac{8\pi}{3}$$

$$\approx 8.38$$