



Quiz 2

MATH 172 Lab: Section 8

Lab Instructor (TA): Mohammed Kaabar

5

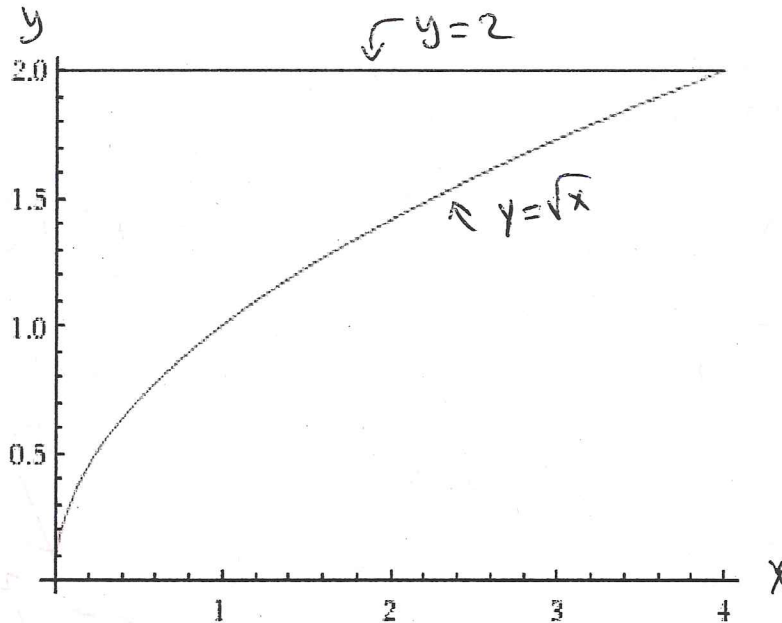
Student's Name: — Solution —

Student's ID: _____

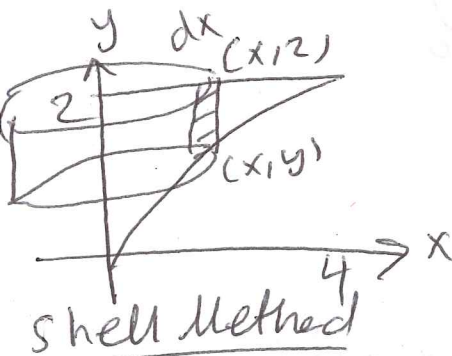
Note: This quiz covers only the volumes by slicing and shells.

Show your work and circle your answers. Neatness and organization count!

Question 1: (3 points) Let R be a region bounded by $y = \sqrt{x}$, $y = 2$, and y -axis as shown in the figure below:

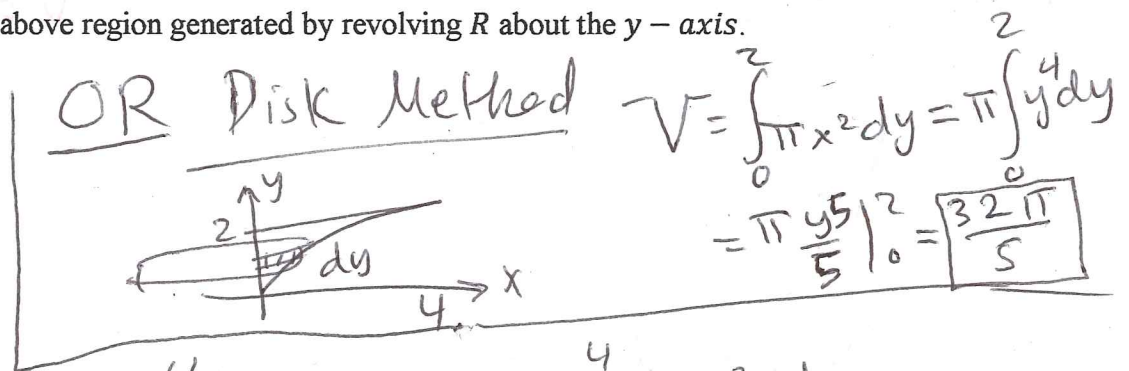


Find the volume of the above region generated by revolving R about the y -axis.



$$V = \int_0^4 2\pi x(2 - \sqrt{x}) dx = 2\pi \int_0^4 (2x - x^{3/2}) dx$$

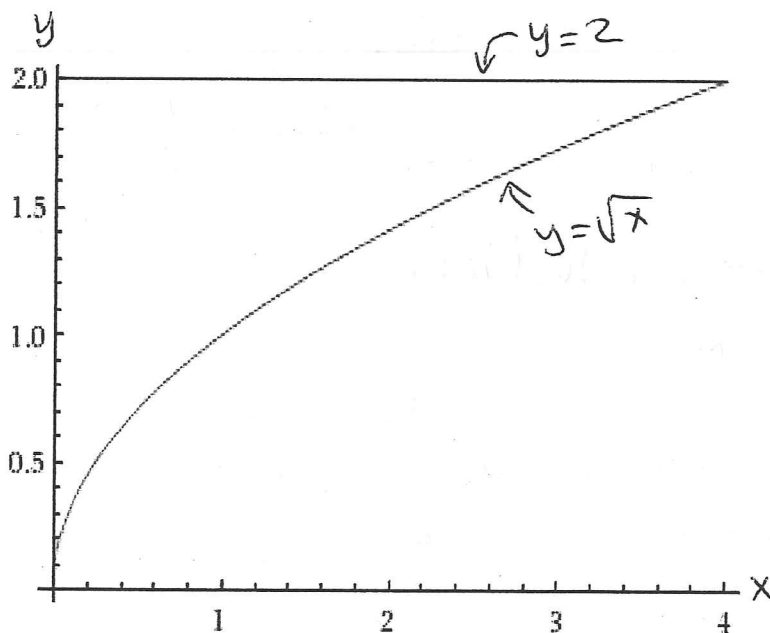
$$= 2\pi \left(x^2 - \frac{x^{5/2}}{5/2} \right) \Big|_0^4 = 2\pi \left(\frac{16}{5} \right) = \frac{32\pi}{5}$$



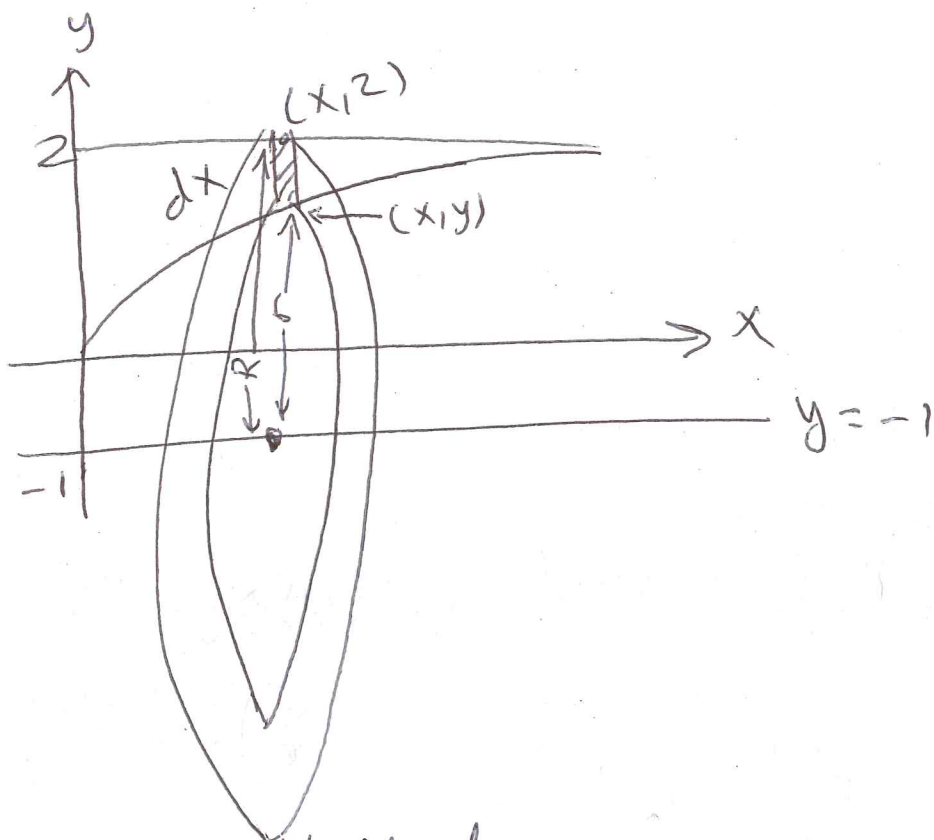
$$V = \int_0^2 \pi x^2 dy = \pi \int_0^2 y^4 dy$$

$$= \pi \frac{y^5}{5} \Big|_0^2 = \frac{32\pi}{5}$$

Question 2: (2 points) Let R be a region bounded by $y = \sqrt{x}$, $y = 2$, and y -axis as shown in the figure below:



SET UP ONLY (DO NOT EVALUATE) an integral that represents the volume of the above region generated by revolving R about $y = -1$.



OR you can use shell method.

$$V = \int_0^2 2\pi(y+1)y^2 dy$$

Washer Method

$$V = \int_0^4 [\pi(3)^2 - \pi(\sqrt{x} + 1)^2] dx = \int_0^4 (\pi(3)^2 - \pi(\sqrt{x} + 1)^2) dx$$