

NAME(+group members): *Solutions*

MATH 172, Section 501; 09/11/2019

Quiz 2

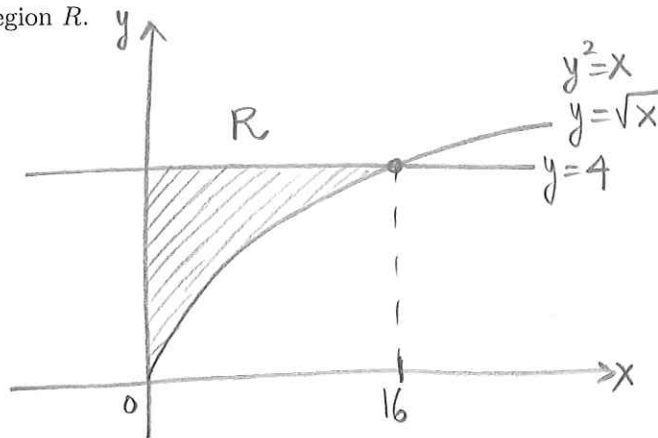
Show your work! You may not use calculators, notes or books.

1. Consider the region R in the xy -plane bounded by the curves:

$$y = \sqrt{x}, \quad x = 0, \quad y = 4.$$

- a). Draw the region R .

(3pts)



(2pts)

- b). Set up an integral to find the area of the region R . Do not compute the numerical value, but do take the antiderivative at the end.

$$\text{Area} = 4 \cdot 16 - \int_0^{16} \sqrt{x} dx = 4 \cdot 16 - \frac{2}{3} x^{3/2} \Big|_0^{16}$$

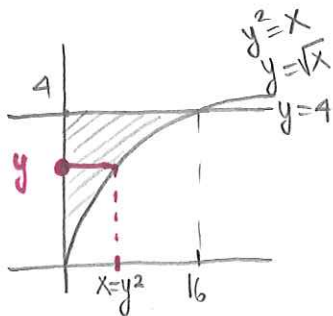
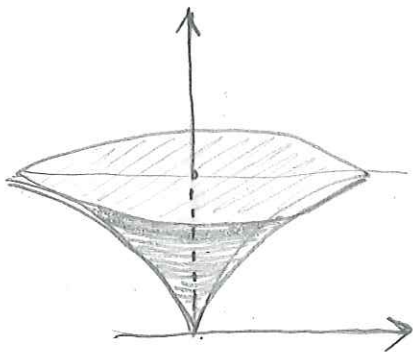
(either one)

OR

$$= \int_0^4 y^2 dy = \frac{y^3}{3} \Big|_0^4$$

(3pts)

- c). Set up an integral to find the volume of the solid obtained by rotating the region R about the y -axis. Do not compute the numerical value, but do take the antiderivative at the end. Sketch the solid to the best of your abilities.



$$A(y) = \pi(y^2)^2 \Rightarrow V = \int_0^4 \pi y^4 dy = \frac{\pi y^5}{5} \Big|_0^4$$

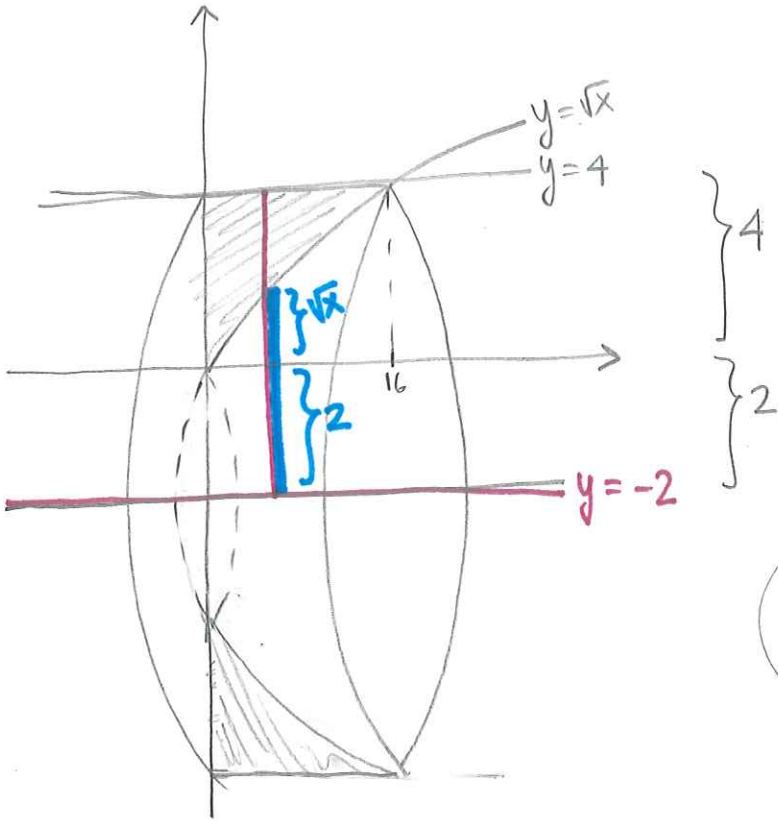
TURN PAGE there's more!

(2pts)

d). Set up an integral to find the volume of the solid obtained by rotating the region R about the line

$$y = -2.$$

Do not compute the numerical value, but ~~do take the antiderivative at the end.~~ Sketch the solid to the best of your abilities.



Outer radius = 6
Inner radius = $2 + \sqrt{x}$

$$V = \int_0^{16} \pi (6^2 - (2 + \sqrt{x})^2) dx$$

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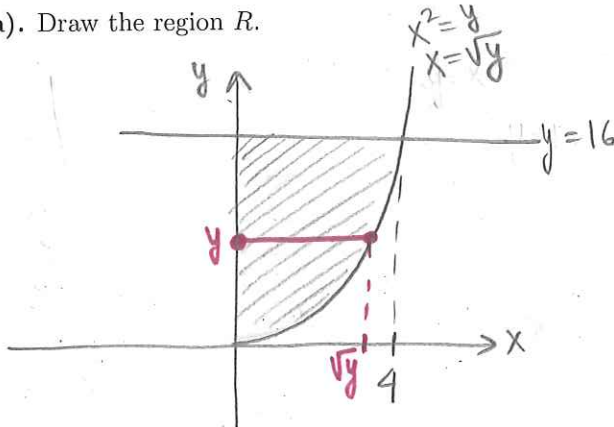
Quiz 2

Show your work! You may not use calculators, notes or books.

1. Consider the region R in the xy -plane bounded by the curves:

$$\sqrt{y} = x, \quad x = 0, \quad y = 16.$$

a). Draw the region R .



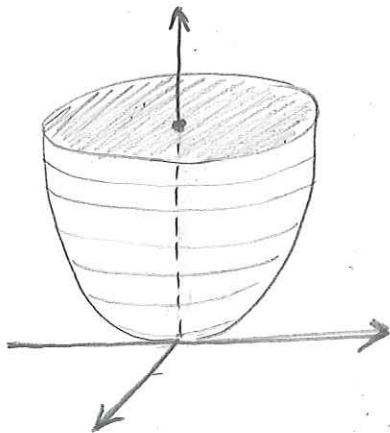
b). Set up an integral to find the area of the region R . Do not compute the numerical value, but do take the antiderivative at the end.

$$\text{Area} = 16 \cdot 4 - \int_0^4 x^2 dx = 16 \cdot 4 - \frac{x^3}{3} \Big|_0^4$$

$$\underline{\text{OR}} = \int_0^{16} \sqrt{y} dy = \frac{2}{3} y^{3/2} \Big|_0^{16}$$

(either one)

c). Set up an integral to find the volume of the solid obtained by rotating the region R about the y -axis. Do not compute the numerical value, but do take the antiderivative at the end. Sketch the solid to the best of your abilities.

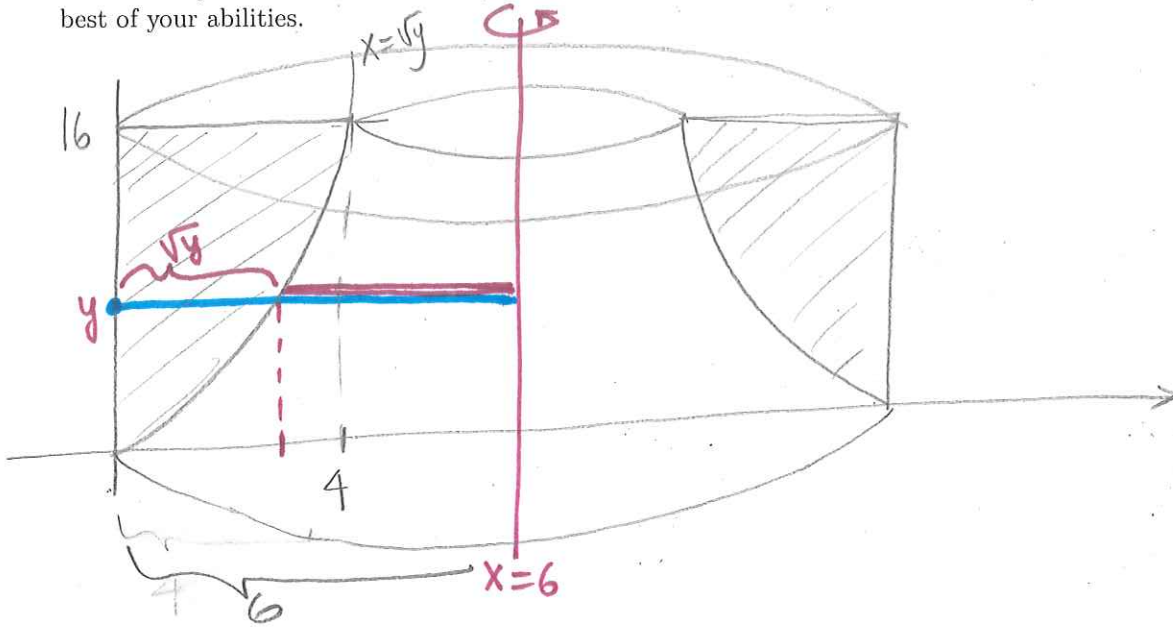


$$A(y) = \pi (\sqrt{y})^2 = \pi y$$

$$V = \int_0^{16} \pi y dy = \pi \frac{y^2}{2} \Big|_0^{16}$$

d). Set up an integral to find the volume of the solid obtained by rotating the region R about the line $x = 6$.

Do not compute the numerical value, but do take the antiderivative at the end. Sketch the solid to the best of your abilities.



Outer radius = 6
 Inner radius = $6 - \sqrt{y}$

$$V = \int_0^{16} \pi (6^2 - (6 - \sqrt{y})^2) dy$$