MATH-241 Calculus I
Worksheet 07

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Fall 2021, 03/12/2021

**Last name:** _____
**First name:** _____
**Section:** _____

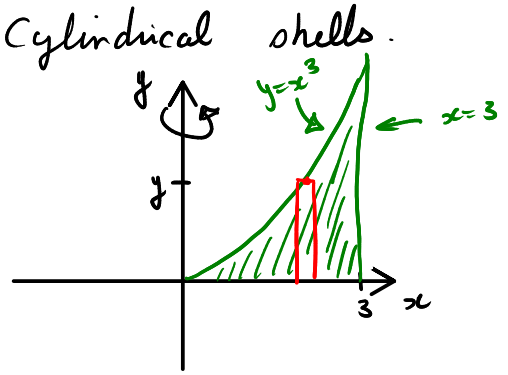
| Question: | 1 | 2 | Total |
|---|---|---|---|
| Points: | 10 | 10 | 20 |
| Score: | | | |

**Instructions:** You must answer all the questions below and give your solutions to the TA at the end of the recitation. Write your solutions on a different sheet of paper. No late worksheet will be accepted.

## Question 1 **(10 pts)**

The following integral represents the volume of a solid. Describe the solid.

$$\int_0^3 2\pi x^5 \, dx.$$

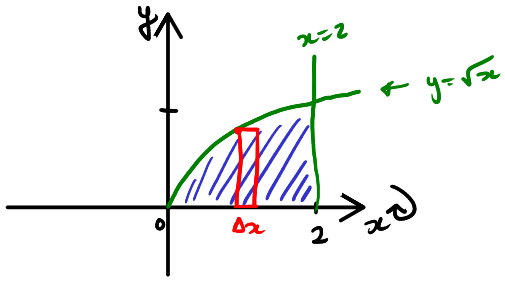



height = $x^5$

## QUESTION 2 (10 pts)

Find the volume of the solid obtained by rotating about the $x$-axis the region bounded by $y = \sqrt{x}$, $x = 0$, and $x = 2$.

(1)




thickness = $\Delta x$

$r_{out} = y = \sqrt{x}$

$r_{in} = 0$.

(2) $A = \pi (r_{out}^2 - r_{in}^2) = \pi \left( (\sqrt{x})^2 - 0^2 \right) = \pi x.$

we integrate from 0 to 2 the var. $x$.

(3) $V = \int_0^2 \pi x \, dx = \frac{\pi x^2}{2}\Big|_0^2 = \frac{\pi 4}{2} =$ $\boxed{2\pi \text{ units}^3}$