

QUIZ 2 - MATH 152

Friday, September 6

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it and do only what is asked. Each problem is worth around 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. [6 points] Consider the solid described as follows:

- Its floor is the region enclosed by the parabola $x = y^2$ and the line $x = 4$;
- Its cross sections perpendicular to the x -axis are squares.

Find the volume of this solid.

2. [4 points] Suppose a rod has length 6 meters. Its linear density is given by

$$\rho(x) = \frac{x}{x^2 + 1} \text{ Kg/m},$$

where x is the distance from its left endpoint. Find the total mass of this rod.

3. [4 points] Find the average value of the function $f(x) = \sin^2 x \cos x$ over the interval $[-\frac{\pi}{2}, \frac{\pi}{2}]$.
(Please, give an exact answer, i.e., leave π in, if needed, without replacing it by a decimal approximation.)