

Quiz #2

Please print your name:

Problem 1. Set up an integral for the length of the curve $y = x^2$ for $-1 \leq x \leq 2$.

Don't try to evaluate!!

Solution.

$$\int_{-1}^2 \sqrt{1 + \left(\frac{dy}{dx}\right)^2} dx = \int_{-1}^2 \sqrt{1 + (2x)^2} dx$$

□

Problem 2. Consider the region bounded by the curves $y = x^2$, $y = 0$ and $x = 2$. Find the volume of the solid generated by revolving this region about the x -axis.

Solution.

- First, you should make a sketch!
- Our region extends from $x = 0$ to $x = 2$ (no real need to compute intersections), so the volume of our solid is

$$\int_0^2 \pi(x^2)^2 dx = \pi \int_0^2 x^4 dx = \pi \left[\frac{1}{5}x^5 \right]_0^2 = \frac{32}{5} \pi.$$

□