

KEY

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Quiz III for Math252

August 6, 2009

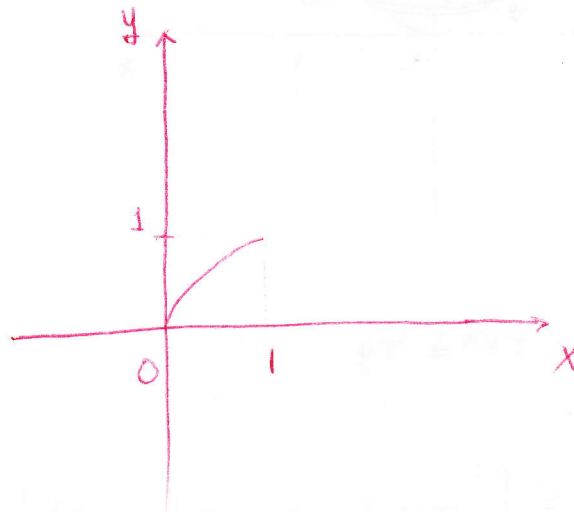
Name:

Instructions: There are two questions. You are given 30 minutes. Show all your work to get partial credits. Good luck!

1. Graph the curve defined by

$$x = y^{3/2}, 0 \leq y \leq 1$$

and find its exact length.



$$L = \int_0^1 \sqrt{\left(\frac{dx}{dy}\right)^2 + 1} dy$$

$$= \int_0^1 \sqrt{\left(\frac{3}{2}y^{1/2}\right)^2 + 1} dy = \int_0^1 \sqrt{\frac{9}{4}y + 1} dy$$

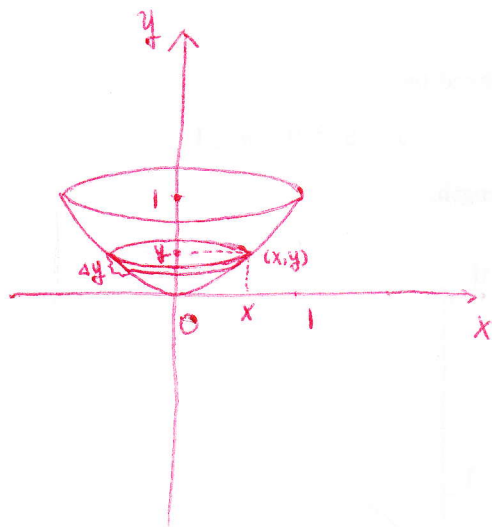
$$= \left[\frac{8}{27} \left(\frac{9}{4}y + 1\right)^{3/2} \right]_0^1$$

$$= \frac{8}{27} \left(\left(\frac{13}{4}\right)^{3/2} - 1 \right) \approx 1.44$$

2. Find the volume of the solid obtained by rotating the region bounded by

$$y = x^2, y = 1, x = 0$$

about the y -axis. Hint: Draw the region and the resulting solid.



$$A(y) = \pi x^2 = \pi y$$

$$V = \int_0^1 \pi y \, dy = \pi \left[\frac{1}{2} y^2 \right]_0^1 = \frac{\pi}{2}$$