

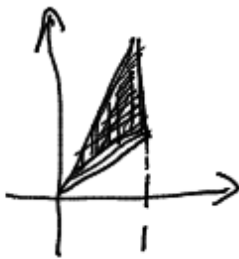
MATH 1930 Sec 092
HONORS CALCULUS II

QUIZ 1

January 18, 2013

Name (Last, First) Key

1. Use the shell method to find the volume of the solid generated by revolving the region bounded by the lines about the y -axis.



$$y = 2x, \quad y = x/2, \quad x = 1$$

$$\text{Volume} = \int_0^1 2\pi \left(2x - \frac{x}{2}\right) x \, dx$$

$$= 2\pi \int_0^1 \left(2x^2 - \frac{x^2}{2}\right) dx$$

$$= 2\pi \left[\frac{2x^3}{3} - \frac{x^3}{6} \right] \Big|_0^1$$

$$= 2\pi \left[\frac{2}{3} - \frac{1}{6} \right] = \boxed{\pi \text{ cubic units}}$$

2. Evaluate the integral.

$$\int \frac{e^{\sqrt{r}}}{\sqrt{r}} dr$$

$$\text{Let } u = \sqrt{r} \\ du = \frac{1}{2\sqrt{r}} dr$$

$$= \int e^u \cdot 2 du$$

$$= 2e^u + C$$

$$= \boxed{2e^{\sqrt{r}} + C}$$