Math 173 - Quiz 9

April 14, 2016

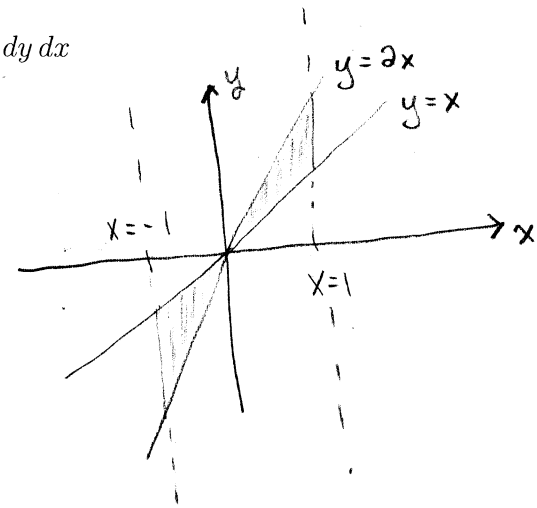
Name key

Score

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Evaluate the iterated integral and sketch the region of integration.

$$\int_{-1}^{1}\int_{x}^{2x} e^{x+y}\,dy\,dx$$



$$\int_{-1}^{1} e^{x+y}\Big|_{y=x}^{y=2x}\,dx$$

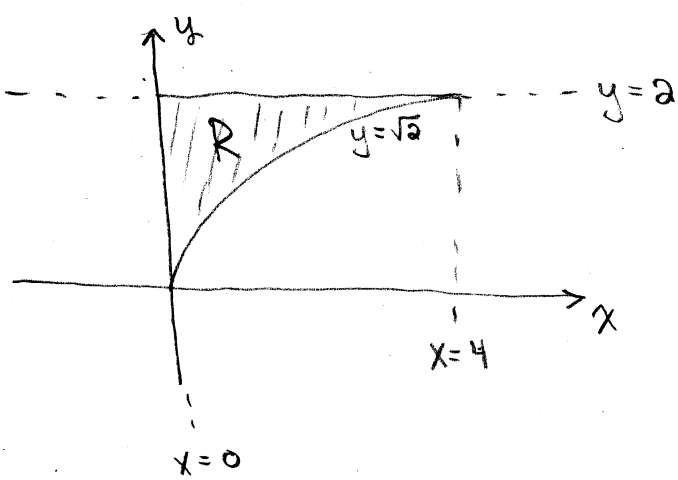
$$= \int_{-1}^{1} e^{3x} - e^{2x}\,dx$$

$$= \frac{1}{3}e^{3x} - \frac{1}{2}e^{2x}\Big|_{-1}^{1}$$

$$= \left[\frac{1}{3}e^{3} - \frac{1}{2}e^{2}\right] - \left[\frac{1}{3}e^{-3} - \frac{1}{2}e^{-2}\right] \approx 3.0517$$

2. (5 points) Evaluate the iterated integral by reversing the order of integration.

$$\int_{0}^{4}\int_{\sqrt{x}}^{2} \sin y^3\,dy\,dx$$



$$= \int_{y=0}^{y=2}\int_{x=0}^{x=y^2} \sin y^3\,dx\,dy$$

$$= \int_{0}^{2} y^2 \sin y^3\,dy$$

$u = y^3$, $\frac{1}{3}du = y^2 dy$

$$= \int_{0}^{8} \frac{1}{3}\sin u\,du$$

$$= -\frac{1}{3}\cos u\Big|_{0}^{8}$$

$$= -\frac{1}{3}\cos 8 + \frac{1}{3} \approx 0.3818$$