

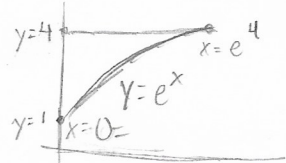
"QUIZ" for Lecture 13

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q13FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 22, 8:00pm

1. Change the order of integration in

$$\int_1^4 \int_0^{\ln y} f(x, y) dx dy = \iint_D f(x, y) dx dy$$



$$D = \{(x, y) \mid 1 \leq y \leq 4, 0 \leq x \leq \ln y\}$$

$$D = \{(x, y) \mid 0 \leq x \leq e^4, e^x \leq y \leq 4\} \Rightarrow$$

$$\int_0^{e^4} \int_{e^x}^4 f(x, y) dy dx$$

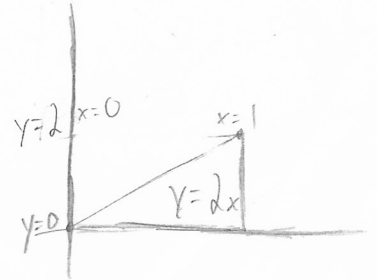
2. Evaluate

$$\int_0^2 \int_{y/2}^1 \frac{1}{(x^2 + 1)^2} dx dy$$

by inverting the order of integration and evaluating the new iterated integral.

$$D = \{(x, y) \mid 0 \leq y \leq 2, y/2 \leq x \leq 1\}$$

$$= \{(x, y) \mid 0 \leq x \leq 1, 0 < y < 2x\}$$



$$\begin{aligned} \Rightarrow \int_0^1 \int_0^{2x} \frac{1}{(x^2 + 1)^2} dy dx &= \int_0^1 \frac{2x}{(x^2 + 1)^2} dx = \int_1^2 \frac{du}{u^2} = \left. -\frac{1}{u} \right|_1^2 \\ &= \boxed{\frac{1}{2}} \end{aligned}$$