"QUIZ" for Lecture 15

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: qXFirstLast.pdf) ASAP BUT NO LATER THAN Oct. 29, 8:00pm

1. Use polar coordinates to compute the double integral

$$\int\int_D xy\,dA \quad ,$$

where

$$D = \{(x,y)\,|\,x^2+y^2 \le 1\,,\, x \ge 0\,,\, y \ge 0\} \quad .$$

x and y ≥ 0 so $\theta = 0 \to \pi/2$ $r^2 \le 1$

$$\int_0^{\pi/2}\int_0^1 r\cos\theta\, r\sin\theta \cdot r\,dr\,d\theta$$

$$= \sin(\pi/2)^2/8 = 1/8$$

2. Evaluate the iterated integral by converting it to polar coordinates

$$\int_0^1 \int_0^{\sqrt{1-y^2}} e^{x^2+y^2}\,dx\,dy \quad .$$

Note: The previous version had a typo ($dy\,dx$ instead of $dx\,dy$, that made it nonsense). I thank Yidi "Wendy" Weng for pointing it out (and see won a dolllar).

$$\int_0^{\pi/2}\int_0^1 e^{r^2}\cdot r\,dr\,d\theta$$

$$= -\frac{\pi}{4} + \frac{e\pi}{4} = \frac{\pi}{4}(e-1)$$