"QUIZ" for Lecture 14

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q14FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 26, 8:00pm

1. Evaluate the iterated integral

$$\int_0^1 \int_x^{3x} \int_0^y x^2 yz \, dz \, dy \, dx \quad .$$

$\int_0^y x^2yz\,dz \rightarrow \frac{x^2yz^2}{2}\Big|_0^y$

$\int_x^{3x} \frac{x^2y^3}{2}\,dy \rightarrow \frac{x^2y^4}{4}\Big|_x^{3x}$

$\int_0^1 20x^4\,dx \rightarrow \frac{20x^7}{7}\Big|_0^1 = \boxed{\frac{20}{7}}$

2. Evaluate the triple integral

$$\iiint_E yz \ln(x^5) dV \quad ,$$

where

$$E = \{(x,y,z) | 0 \le x \le 1,\ 0 \le y \le x,\ 2x \le z \le 3x\} \quad .$$

$\int_{2x}^{3x} yz\ln(x^5)\,dz \rightarrow \frac{5\ln(x)yz^2}{2}\Big|_{2x}^{3x}$

$\int_0^x \frac{25x^2\ln(x)y}{2}\,dy \rightarrow \frac{25x^2\ln(x)y^2}{4}\Big|_0^x$

$\int_0^1 \frac{25x^4\ln(x)}{4}\,dx \rightarrow \frac{x^5(5\ln(x)-1)}{4}\Big|_0^1 = \boxed{-\frac{1}{4}}$