NAME: Lyell Read Email: [redacted]@oregonstate.edu

MATH 254H, Fall 2018 QUIZ #3

FOR EACH PROBLEM SHOW ALL ESSENTIAL STEPS.

1. Find the better order and evaluate the integrals.

(a) $\iint_R (y+1)e^{x(y+1)}dA, \quad R = \{(x,y) : 0 \le x \le 1,\ -1 \le y \le 1\}$ =

1] $\int_0^1 (y+1)\, e^{x(y+1)}\, dx$ ($y+1$: Const; $x(y+1)$: Const; $dx$: ANTI.D.) $\quad e^{x(y+1)}\Big|_{x=0}^{1} = e^{y+1} - 1$

2] $\int_{-1}^{1} e^{y+1} - 1\, dy$ ($dy$: ANTI.D.) $\quad e^{y+1} - y\Big|_{-1}^{1} \left[e^2 - 1\right] - \left[1+1\right]$

$e^2 - 3$ ✓

(b) $\iint_R 6x^5 e^{x^3 y}dA, \quad R = \{(x,y) : 0 \le x \le 2,\ 0 \le y \le 2\}$ = $\int_0^2\int_0^2 6x^5 e^{x^3 y}\, dy\, dx$

1] $\int_0^2 6x^5 e^{x^3 y}\, dy$ ($x^3$: Const; $dy$: ANTI.D.) $\quad 6x^2 e^{x^3 y}\Big|_0^2 \quad 6x^2 e^{x^3 \cdot 2} - 6x^2$

$= 6x^2\left(e^{x^3\cdot 2} - 1\right)$

2] $\int_0^2 6x^2\left(e^{x^3\cdot 2} - 1\right)$ ($6x^2$: $= 6x^2 e^{x^3\cdot 2} - 6x^2$; ANTI.D.) $\quad e^{x^3\cdot 2} - 2x^3\Big|_0^2 = \left[e^{16} - 16\right] - \left[1\right]$

$= e^{16} - 17$ ✓