

Name: _____
Math 20300-ST Calculus III

Due 12/18/2018
Quiz 5

Please show all work and **box your final answers**. If you need more room, you may use the backs of the pages. Calculators are not allowed. Good luck!

1. (10 points) Evaluate $\iiint_E 6xy \, dV$, where E lies under the plane $z = 1 + x + y$ and above the region in the xy -plane bounded by the curves $y = \sqrt{x}$, $y = 0$, and $x = 1$.

2. (10 points) Evaluate $\iiint_E x \, dV$, where E is enclosed by the planes $z = 0$ and $z = x + y + 5$ and by the cylinders $x^2 + y^2 = 4$ and $x^2 + y^2 = 9$.

3. (10 points) Evaluate $\iiint_E x e^{x^2+y^2+z^2} dV$, where E is the portion of the unit ball $x^2 + y^2 + z^2 \leq 1$ that lies in the first quadrant.

4. Determine whether each of the following series converges absolutely, converges conditionally, or diverges.

(a) (5 points) $\sum_{n=2}^{\infty} \frac{(-1)^n}{n \ln n}$

(b) (5 points) $\sum_{n=1}^{\infty} (-1)^n \frac{2^n n!}{5 \cdot 8 \cdot 11 \cdots (3n + 2)}$

(c) (5 points) $\sum_{n=1}^{\infty} \frac{e^n}{(2n-1)\sqrt{2}^n}$