MAT 397 CAL III Josh Stangle Fall 2016

TEST 3

Your Name (please PRINT): _____

Student ID Number: _____

INSTRUCTIONS

- Fill in the above items.
- There is a total of 6 problems, for a maximum possible total value of 58 points. **Make sure you have all 7 test pages (this cover page + 6 test pages)**. You are responsible to check that your test booklet has all 7 pages. Alert a proctor if your copy is missing any pages.
- **Show all your work.** Only minimal credit will be given for answers without supporting work.
- **Write your answer in the box** at the bottom of pages 2-7.
- **Use the back of test pages if additional space is needed**, and for scratch paper.
- **No calculators or other electronic devices; no outside notes; no outside tables** are allowed on this exam. Any use of calculators or electronic devices, or outside notes is a violation of the Academic Integrity Policy.

Do not write below this line

Pb. #	Max Points	Your Score
1	10	
2	10	
3	10	
4	10	
5	10	
6	8	
Total	(58)	

1. (10 pts) Let D be the square bounded by $(0,2)$, $(2,2)$, $(1,3)$, and $(1,1)$. Use a change of variables with the transformation $x = \frac{1}{2}(v-u)$ and $y = \frac{1}{2}(v+u)$ to compute

$$\iint_D \sin(x+y)dA.$$

Answer :

2. (10 pts) Compute the volume bounded by the surface $z = \sqrt{x^2 + y^2}$ and the parts of the circles $x^2 + y^2 = 4$ and $x^2 + y^2 = 16$ in the right half of the xy-plane.

Answer:

3. (8 pts) Let E be the region bounded by the surfaces $y = x^2$, $y = 1$, $z = 0$ and $z = y+2$. Compute

$$\iiint_E x^2 + y dV$$

Answer:

4. (10 pts) Compute the following integral where B is the region bounded by the spheres $x^2 + y^2 + z^2 = 1$ and $x^2 + y^2 + z^2 = 9$ in in the upper half plane.

$$\iiint_B \sqrt{x^2 + y^2 + z^2} dV$$

Answer:

5. (10 pts) Let B be the region bounded by the cone $z = \sqrt{x^2 + y^2}$, the plane $z = 0$ and the cylinder $x^2 + y^2 = 9$. Compute

$$\iiint_B x + (x^2 + y^2) dV$$

Answer:

6. (8 pts) The following questions are false. Either correct the statement, provide a counter example, or state why it is false. Your answer must be in complete sentences.

(a) For any continuous function $f(x, y)$, then

$$\int_0^1 \int_0^x f(x, y)dydx = \int_0^1 \int_0^y f(x, y)dxdy.$$

(b) The Jacobian of the transformation T given by $x = 2u^2 + 5v$ and $y = 2v - 3u^3$ is $4u^3 - 12v$.

Answer for part (a):
Answer for part (b):