

NAME:

Section:

MATH 251 (1-6,10-11), Dr. Z. , Fourth Practice Test for Exam #2

Do not write below this line (office use only)

1. (out of 10)

2. (out of 10)

3. (out of 10)

4. (out of 10)

5. (out of 10)

6. (out of 10)

7. (out of 10)

8. (out of 10)

9. (out of 10)

10. (out of 10)

total:

1. (10 points) Find the maximum of xyz subject to the constraint $x + y + z = 6$.

Ans:

2. (10 points) Evaluate the line integral

$$\int_C 2y \, dx + 3x \, dy + 6yz \, dz \quad ,$$

where $C : x = t^2, y = t^2, z = 2t, 0 \leq t \leq 2$.

Ans.:

3. (10 points) Evaluate the line integral,

$$\int_C x^2 y \, ds \quad ,$$

where C is top half of the circle $x^2 + y^2 = 9$.

Ans.:

4. (10 points) Evaluate the triple integral

$$\int \int \int_E yze^{x^5} dV \quad ,$$

where

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

Ans.:

5. (10 points) Evaluate the integral

$$\iint_D e^{-x^2-y^2} dA \quad ,$$

where

$$D = \{(x, y) \mid x \geq y \geq 0, x^2 + y^2 \leq 1\} \quad .$$

Ans.:

6. (10 points) Evaluate the integral

$$\iint_D e^{-4x^2-4y^2} dA \quad ,$$

where D is the region bounded by the semi-circle $x = \sqrt{1-y^2}$ and the y -axis.

Ans.:

7. (10 points) Evaluate the triple integral

$$\int \int \int_E yz\sqrt{1+x^5} dV \quad ,$$

where

$$E = \{(x, y, z) \mid 0 \leq x \leq 1, 0 \leq y \leq x, x \leq z \leq 2x\} \quad .$$

Ans.:

8. (10 points) Use Lagrange multipliers to find the maximum and minimum values of $f(x, y) = 1 + 3x + 2y$ subject to the constraint $x^2 + y^2 = 25$.

maximum value:

minimum value:

9. (10 points) Find the volume of the solid bounded by the cylinder $y = x^2$ and the planes $z = 0$ and $y + z = 1$. Simplify as much as you can.

Ans.:

10. (10 points) Sketch the region of integration and change the order of integration.

$$\int_0^2 \int_{x^3}^8 g(x, y) \, dy \, dx$$

Ans.:
