

No calculator, no cell phones, no pagers, no electronic devices at all.

You may bring in a single “cheat sheet”. One ordinary 8.5 x 11 sheet of paper with anything you want written on both sides.

Name_____

Hand in to your TA – Circle your TA section:

DIS 321	T 8:50	Milind Shah
DIS 322	R 8:50	Milind Shah
DIS 323	T 9:55	Milind Shah
DIS 324	R 9:55	Milind Shah
DIS 325	T 11:00	Duygu Unlu
DIS 326	R 11:00	Duygu Unlu
DIS 327	T 12:05p	Duygu Unlu
DIS 328	R 12:05p	Duygu Unlu
DIS 329	T 1:20p	Kiran Manchikanti
DIS 330	R 1:20p	Kiran Manchikanti
DIS 331	T 2:25p	Lipika Dekka
DIS 332	R 2:25p	Lipika Dekka
DIS 333	T 3:30p	Lipika Dekka
DIS 334	R 3:30p	Lipika Dekka

Problem	Points	Score
1	10	
2	14	
3	14	
4	14	
5	14	
6	14	
7	8	
8	12	
Total	100	

1. (10 pts) Calculate the double Riemann sum of f for the partition of R given by the indicated lines and the given choice of (x_{ij}^*, y_{ij}^*) .

$$f(x, y) = x^2 + 4y, \quad R = \{(x, y) \mid 0 \leq x \leq 2, \ 1 \leq y \leq 3\},$$

$$x = 1, \ y = 2; \quad (x_{ij}^*, y_{ij}^*) = \text{upper right corner of } R_{ij}.$$

2. (14 pts) Calculate the double integral:

$$\int \int_R x \cos(x + y) \, dA, \quad R = [0, \frac{\pi}{2}] \times [0, \pi]$$

3. (14 pts) Evaluate the integral by reversing the order of integration:

$$\int_0^2 \int_{y^2}^4 ye^{x^2} dx dy$$

4. (14 pts) Evaluate the integral by converting to polar coordinates:

$$\int_0^3 \int_{-\sqrt{9-y^2}}^{\sqrt{9-y^2}} x^2 y \, dx dy$$

5. (14 pts) Find the mass of the lamina (a thin plate) that occupies the region D and has a density function $\rho(x, y) = x$. The region D is bounded by the parabola $x = y^2$ and the line $y = x - 6$.

6. (14 pts) Evaluate the triple integral $\int \int \int_E (x^2 + y^2)^2 \, dV$ where E is the three dimensional solid bounded by the paraboloid $z = x^2 + y^2$ and the plane $z = 4$.

7. (8 pts) Find the gradient field $\nabla \mathbf{f}$ of $f(x, y) = e^{xy^2}$.

8. (12 pts) Evaluate the line integral $\int_C \mathbf{F} \cdot d\mathbf{r}$ where

$$\mathbf{F}(x, y, z) = \sin(x) \mathbf{i} + \cos(y) \mathbf{j} + yz \mathbf{k}$$

$$\mathbf{r}(t) = t \mathbf{i} + t^2 \mathbf{j} + t^3 \mathbf{k} \quad 0 \leq t \leq 1$$

Answers

1. 50

2. -2

3. $\frac{1}{4}(e^{16} - 1)$

4. $\frac{162}{5}$

5. $\int_{-2}^3 \int_{y^2}^{y+6} x dx dy = \frac{250}{3}$

6. $\frac{64}{3}\pi$

7. $\nabla \mathbf{f} = y^2 e^{xy^2} \mathbf{i} + 2xy e^{xy^2} \mathbf{j}$

8. $\sin(1) - \cos(1) + \frac{11}{8}$