

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_____

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) 13.1-9

Let V be the volume of the solid that lies under the graph of $f(x, y) = \sqrt{52 - x^2 - y^2}$ and above the rectangle given by $2 \leq x \leq 4$, $2 \leq y \leq 6$. For the partition R defined by the lines $x = 3$ and $y = 4$, let L and U be the Riemann sums computed using lower left corners and upper right corners, respectively. Without calculating the numbers V , L , and U , arrange them in increasing order and explain your reasoning.

2. (14 pts) 13.2-23

Sketch the volume of the solid whose volume is given by the iterated integral $\int_0^1 \int_0^1 (4 - x - 2y) \, dx \, dy$.

3. (14 pts) 13.3-37

Sketch the region of integration and change the order of integration.

$$\int_0^4 \int_{y/2}^2 f(x, y) dx dy$$

4. (14 pts) 13.4-21

Use polar coordinates to find the volume of the solid inside both the cylinder $x^2 + y^2 = 4$ and the ellipsoid $4x^2 + 4y^2 + z^2 = 64$.

5. (14 pts) 13.5-11

Find the mass of the lamina (a thin plate) that occupies the region

$$D = \{(x, y) \mid 0 \leq y \leq \sin x, 0 \leq x \leq \pi\}$$

and has a density function $\rho(x, y) = y$.

6. (14 pts) 13.7-13

Evaluate the triple integral $\int \int \int_E z dV$ where E is the three dimensional solid bounded by the planes $x = 0$, $y = 0$, $z = 0$, $y + z = 1$, and $x + z = 1$.

7. (8 pts) 14.1-3

Sketch the vector field $\mathbf{F}(x, y) = y \mathbf{i} + \mathbf{j}$.

8. (12 pts) 14.2-37

Find the work done by the force field

$$\mathbf{F}(x, y, z) = xz \mathbf{i} + yx \mathbf{j} + zy \mathbf{k}$$

on a particle that moves along the curve $\mathbf{r}(t) = t^2 \mathbf{i} - t^3 \mathbf{j} + t^4 \mathbf{k}$, $0 \leq t \leq 1$.