

Final Examination

Examination time: 2:15 -5:00 pm. No electronic devices, books, or notes are allowed.
Please show all of your work.

Name _____
TA Name _____

Student ID# _____
Recitation # _____

Problem	1	2	3	4	5	6	Total
Points							
Total	10	10	10	10	10	10	60

7	8	9	10	11	12	13	14	Total
10	15	10	10	15	15	10	15	100

MAT 126	Calculus B				
LEC 01	TuTh	10:00am-11:20am	Simons Centr	103	Yaar Solomon
R01	F	10:00am-10:53am	Library	E4310	Yu Zeng
R03	Tu	1:00pm- 1:53pm	Mathematics	P131	Joseph Thurman
R04	Th	4:00pm- 4:53pm	Mathematics	P131	Mariangela Ferraro
R05	W	5:30pm- 6:23pm	Library	W4530	Alaa Abd-El-Hafez
R19	W	4:00pm- 4:53pm	Earth and Space	069	Alaa Abd-El-Hafez
LEC 02	MWF	10:00am-10:53am	Simons Centr	103	David Kahn*
R06	M	12:00pm-12:53pm	Harriman	112	Deb Wertz
R07	Th	10:00am-10:53am	Library	W4535	Cameron Crowe
R08	Tu	8:30am- 9:23am	Library	W4525	Charles Cifarelli
R17	Tu	4:00pm-4:53pm	Harriman	112	Thomas Rico
R18	Tu	5:30pm-6:23am	Physics	P127	Thomas Rico
LEC 03	TuTh	5:30pm- 6:50pm	Engineering	145	Oleksandr Tsymbaliuk
R12	M	5:30pm- 6:23pm	Earth and Space	079	Mariangela Ferraro
R13	M	4:00pm- 4:53pm	Library	W4535	Jack Burkart
R14	Th	2:30pm- 3:23pm	Lgt Engr Lab	152	Yu Zeng
R16	Th	7:00pm- 7:53pm	Library	E4310	Joseph Thurman

Some useful information:

	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	π	$\frac{3\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1	0	-1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0	-1	0
tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	und	0	und

$$\sin^2 x + \cos^2 x = 1$$

$$1 + \tan^2 x = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

$$\cot x = \frac{1}{\tan x}$$

$$\sec x = \frac{1}{\cos x}$$

$$\csc x = \frac{1}{\sin x}$$

$$\sin^2 x = \frac{1}{2}(1 - \cos 2x)$$

$$\cos^2 x = \frac{1}{2}(1 + \cos 2x)$$

DO PART ONE IF YOU HAVE ***NOT PASSED BOTH*** OF THE MINIMUM COMPETENCE PARTS OF THE MIDTERMS.

IF YOU HAVE ***PASSED BOTH*** OF THE MINIMUM COMPETENCE PARTS OF THE MIDTERMS, GO DIRECTLY TO PART TWO.

Part One – Minimum Competence

1) $\int_1^2 (3x^2 + 5x + 4) dx =$

Answer (10 points)

2) $\int 2xe^x dx =$

Answer (10 points)

3) $\int_0^{\frac{\pi}{2}} \sin^2 x \cos x dx =$

Answer (10 points)

4) $\int \frac{x}{x^2 + 2} dx =$

Answer (10 points)

5) $\int \frac{7x-5}{x^2-x-2} dx =$

Answer (10 points)

6) $\int_4^{\infty} e^{-2x} dx =$

Answer (10 points)

Part Two

- 7) The region R is formed by the curves $y = x^2 - 2x$ and $y = x + 4$.
Find the area of R .

Answer (10 points)

8) The region R is formed by the curves $y = e^x$, $y = 14$, $x = 0$, and $x = 2$.

a) Find the volume of the solid that results when R is revolved around the x -axis using the Washer Method. ***Yes, you must evaluate this integral.***

Answer (10 points)

b) Find the volume of the solid that results when R is revolved around the line $y = -2$ using the Washer Method. ***Set up but do not evaluate this integral.***

Answer (5 points)

9) The region R is formed by the curves $x = y^3$ and $x = \sqrt[3]{y}$ in the first quadrant. Use the Shell Method to find the volume of the solid that results when R is revolved around the x -axis.

Answer (10 points)

10) Find the average value of $y = xe^{3x}$ on the interval $[0, 2]$.

Answer (10 points)

11) Find the length of the arc of the curve defined by $y = \frac{2}{3}x^{\frac{3}{2}} - 1$ on the interval $[0,1]$

Answer (15 points)

12) $\int \frac{11x^2 - 12x + 5}{(x^2 + 1)(x - 2)} dx =$

Answer (15 points)

13) $\int_3^{\infty} \frac{xdx}{(x^2 + 1)^2}$

Answer (10 points)

14) Find the area of the region in the first quadrant formed by the curve $r = \sin \theta + \cos \theta$ and the coordinate axes on the interval $\left[0, \frac{\pi}{2}\right]$.

Answer (15 points)