

MATH 162 FINAL EXAM, Fall 2021

Simplify answers. Show all work. (Part I)		Name:	Score	
1.	a) Find: $\int x \sin 2x \, dx$.	b) $\int \sin^2 x \cos x \, dx$.	1	11
			2	12
			3	13
			4	14
			5	15
			6	16
			7	17
			8	18
Ans:_____.		Ans:_____.		
2.	$\int \sqrt{4-x^2} \, dx$		9	19
			10	20
			Tot	
			Ans:_____.	
3.	Find: $\int \frac{8}{x(x^2+4)} \, dx$.		Ans:_____.	
			Ans:_____.	
4.	Evaluate the following improper integrals a) $\int_0^\infty x e^{-5x} \, dx$	b) $\int_0^\infty \frac{1}{9+x^2} \, dx$	Ans:_____.	
			Ans:_____.	
5.	Find the area of the cardioid $r = 2(1 + \cos \theta)$. a) Set up the integral	b) Compute the area.	Ans:_____.	
			Ans:_____.	
Extra Space				

Part II. Fin162F21p3		Name:
11.	a) Compute: $\lim_{n \rightarrow \infty} n \sin(1/n)$.	b) Sum the series: $\sum_{n=2}^{\infty} \frac{2}{n(n+1)}$.
	Ans: _____.	Ans: _____.
12.	a) Sum the series $\sum_{n=2}^{\infty} \frac{2^n}{3^{n+1}}$.	b) Write as a fraction: 1.23545454...
	Ans: _____.	Ans: _____.
13.	Determine whether the following series converge or diverge and if so, by what test	
a)	$\sum_{n=1}^{\infty} \frac{n^2 - 1}{n^2 + 1}$.	b) $\sum_{n=1}^{\infty} \frac{1}{(\ln 2)^n}$.
	C D : _____ test.	C D : _____ test.
14.	Test for absolute or conditional convergence: $\sum_{n=1}^{\infty} \frac{(-1)^n n^5 5^n}{(n+1)!}$.	
		CC CA D by: _____ test .
15.	Test for absolute or conditional convergence: $\sum_{n=1}^{\infty} \frac{(-1)^n 4n}{n^3 + 1}$.	
		CC CA D by: _____ test .
	Extra Space	

16.	Test for absolute or conditional convergence: $\sum_{n=1}^{\infty} \frac{(-1)^n}{4n \ln n}$.
CC CA D by: _____ test .	

17.	Find the interval of convergence for $\sum_{n=1}^{\infty} \frac{(x-2)^n}{3^n(n+4)}$.
Ans: _____.	

18.	Find the first four non-zero terms of the Maclaurin series for:
a) $f(x) = x \sin(x^2)$	b) $f(x) = \frac{1}{1-4x}$.
Ans: _____.	Ans: _____.

19.	Use a power series to approximate the definite integral to 4 decimal places: $\int_0^{1/2} e^{-x^2} dx$
a) Power series of e^{-x^2}	b) Value of integral. How many terms are needed?
Ans: _____.	Ans: _____.

20.	Use Taylor's formula to find the first four non-zero terms of the Maclaurin series for $f(x) = \sqrt{1+x}$.
Ans: _____.	