

MATH 162 Sample Final Exam

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
2.	$\int \sqrt{4 - x^2} \, dx$		9	19
			10	20
			Tot	
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				

Fin162F21p2		Name:
6.	a) Solve: $xy' + 2y = e^x$.	b) Solve: $y' = e^{x-y}$.
	Ans:_____.	Ans:_____.
7.	a) Solve: $y'' + 6y' + 9y = 0$.	b) Solve: $y'' + y' + y = 0$.
	Ans:_____.	Ans:_____.
8.	Find the length of the curve $x(t) = 1 + 3t^2$, $y(t) = 4 + 2t^3$, for $0 \leq t \leq 1$.	
	Ans:_____.	
9	Let $9x^2 - 4(y - 2)^2 = 36$. a) Find the coordinates of the vertices.	b) Find the foci.
	Ans:_____.	Ans:_____.
10.	The equation of a conic is given by $r = \frac{9}{6 - 2 \cos \theta}$. Find:	
	a) The eccentricity and directrix.	b) The vertices and foci.
	Ecc=_____. Eq:_____.	Vertices:_____. Foci:_____.

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	

Fin162F21p4		Name:
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:_____.	