

Midterm 2
MAT 127
Oct 29, 2018

Name: (please print)	ID #:
Your section:	(see list below)

	1	2	3	4	5	Total
	20pt	10pt	10pt	10pt	10pt	60pts
<i>Grade</i>						

No notes, books or calculators.

You must show your reasoning, not just the answer. Answers without justification will get only partial credit.

Please cross out anything that is not part of your solution — e.g., some preliminary computations that you didn't need.

Lecture 1	MWF 10:00am-10:53am	Chuanhao Wei
Lecture 2	MF 1:00 pm – 2:20 pm	Jingrui Cheng
Lecture 3	TuTh 10:00 am – 11:20 am	Sabyasachi Mukherjee
Lecture 4	TuTh 5:30 pm – 6:50 pm	Babak Modami

1. (20 pts)

(a) Calculate the degree 3 Taylor polynomial $T_3(x)$ of $f(x) = \sqrt{x}$ centered at $a = 1$.

- (b) Approximate $\sqrt{2}$ by the Taylor polynomial computed in the previous part. (No need to compute error bound.)

2. (10 pts)

Using the Maclaurin series expansions of e^x and $\cos(x)$ given below

$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!} = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \cdots,$$

$$\cos(x) = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} x^{2n} = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} + \cdots,$$

find the first three non-zero terms of the Maclaurin series of $f(x) = e^x \cos(2x)$.