

Name: _____ PID: _____

TA: _____ Sec. No: _____ Sec. Time: _____

Math 10C

Midterm Exam 2 Nov 19, 2008

Turn off and put away your cell phone.

No calculators or any other devices are allowed on this exam.

You may use one page of notes, but no books or other assistance on this exam.

Read each question carefully, answer each question completely, and show all of your work.

Write your solutions clearly and legibly; no credit will be given for illegible solutions.

If any question is not clear, ask for clarification.

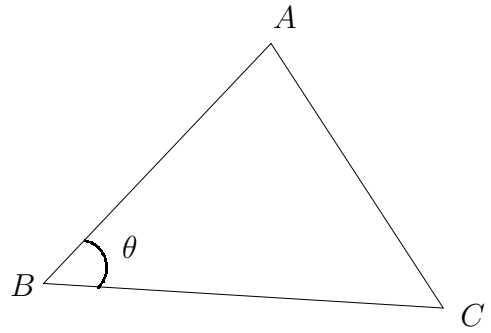
The last page is blank for extra workspace.

Should your answer for any problem exceed the space provided, please write “see last page” and continue your work on the last page.

#	Points	Score
1	11	
2	9	
3	6	
4	8	
Σ	34	

1. Let $A = (1, 5, -2)$, $B = (-1, 0, 3)$ and $C = (2, -2, 0)$.

(a) (3 pts) Find the cosine of the angle θ .



(b) (4 pts) Find the area of the triangle with vertices A , B and C .

(c) (4 pts) Find the equation of the plane that contains A , B and C .

2. Let $f(x, y) = \cos(\ln(x + 15y))$. Find:

(a) (3 pts) $\frac{\partial f}{\partial x}$

(b) (3 pts) $\frac{\partial f}{\partial y} \Big|_{(1,0)}$

(c) (3 pts) $\frac{\partial}{\partial y} f_x$

3. Let $f(x, y) = \frac{2x}{x + y}$.

(a) (4 pts) Find the directional derivative of f at $P = (-1, 2)$ in the direction of the vector $\vec{v} = \langle 1, -3 \rangle$.

(b) (2 pts) What is the greatest possible rate of increase of f at $P = (-1, 2)$?

4. Let $f(x, y) = \sqrt{3x^2 - y^2}$.

(a) (5 pts) Find an equation for the tangent plane of the surface $z = f(x, y)$ at $(1, 0, \sqrt{3})$.

(b) (3 pts) Approximate the value of $f(0.9, 0.01)$ using the linearization of $f(x, y)$ near $(x, y) = (1, 0)$.

Extra space