Name: _____

February 18th, 2015.
Math 2401; Sections K1, K2, K3.
Georgia Institute of Technology
Exam 2

I commit to uphold the ideals of honor and integrity by refusing to betray the trust bestowed upon me as a member of the Georgia Tech community. By signing my name below I pledge that I have neither given nor received help on this exam.

Pledged: _____

Problem	Possible Score	Earned Score
1	18	
2	16	
3	17	
4	16	
5	18	
6	15	
Total	100	

Remember that you must SHOW YOUR WORK to receive credit!

Good luck!

2. [16 points] Find equations for the tangent plane to the surface given by:

$$\sin(xyz) = x + 2y + 3z$$

at the point $(2, -1, 0)$.

3. [17 points] Find the directions in which the directional derivative of $f(x, y) = x^2 + \sin(xy)$ at the point $(1, 0)$ is equal to 1.

4. [16 points] Suppose $f(x, y, z)$ has continuous first-order partial derivatives and:

$$f_x(2, 1, -1) = 3; \;\; f_x(4, 3, 2) = -2;$$

$$f_y(2, 1, -1) = -5; \;\; f_y(4, 3, 2) = -2;$$

$$f_z(2, 1, -1) = 7; \;\; f_z(4, 3, 2) = -1.$$

If g is given by:

$$g(t) = f\left(2t^2, t^3, -\frac{1}{t^2}\right),$$

find $g'(1)$.

5. [18 points] Find all the critical points of the function:

$$f(x, y) = x^4 + 4xy + xy^2$$

and classify each one as a local minimum, a local maximum, or a saddle point.

6. [15 points] Find the absolute minimum and maximum of the function:

$$f(x, y) = e^{-xy}$$

on the region described by:

$$x^2 + 4y^2 \leq 1.$$

Name: _____

March 23rd, 2015.
Math 2401; Sections K1, K2, K3.
Georgia Institute of Technology
Exam 3

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Pledged: _____

Problem	Possible Score	Earned Score
1	20	
2	20	
3	20	
4	18	
5	16	
6	6	
Total	100	

Remember that you must SHOW YOUR WORK to receive credit!

Good luck!

1. [20 points] Compute the double integral:

$$\iint_R y \sin(xy)\, dA,$$

where R is the rectangle in the xy-plane given by $1 \leq x \leq 2$; $0 \leq y \leq \pi$.

3. [20 points] Consider the integral:

$$\int_0^9 \int_{y^2}^9 y \cos(x^2)\, dx\, dy.$$

a). Sketch the region of integration.
b). Compute the integral (you may want to switch the order of integration if you cannot compute it as given).

4. [18 points] Sketch the region of integration and compute the integral:

$$\iint_R e^{-x^2-y^2}\, dA,$$

where R is the region in the x, y-plane bounded by the semicircle $x = \sqrt{4 - y^2}$ and the y-axis.