Name:	

September 10th, 2014. Math 2401; Sections D1, D2, D3. Georgia Institute of Technology Exam 1

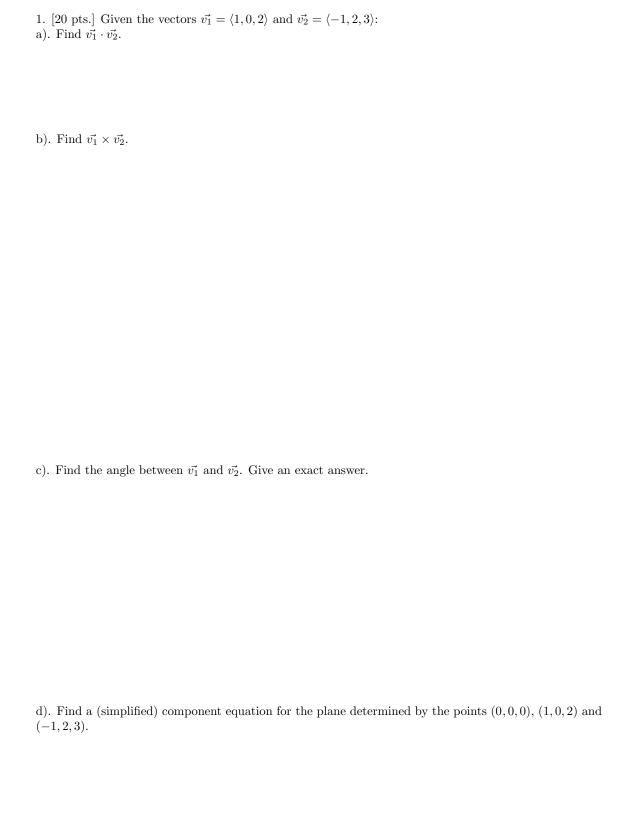
I commit to uphold the ideals of honor and integrity by refusing to be tray the trust bestowed upon me as a member of the Georgia Tech community. By signing my name below I pledge that I have neither given nor received help on this exam.

Pledged:	
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Problem	Possible Score	Earned Score
1	20	
2	20	
3	10	
4	20	
5	20	
6	10	
Total	100	

Remember that you must SHOW YOUR WORK to receive credit!

Good luck!



2. [20 pts.] Find parametric equations for the line that is tangent to the curve:

$$\vec{r}(t) = \left(\ln\frac{t}{3}\right)\vec{i} + \left(\frac{t-3}{t+6}\right)\vec{j} + \left(t\ln\frac{t}{3}\right)\vec{k},$$

at the point on the curve where t = 3.

3. [10 pts.] Express the vector $\overrightarrow{P_1P_2}$ in the form $a\vec{i}+b\vec{j}+c\vec{k}$, where P_1 is the point (4,-3,8) and P_2 is the point (-9,-9,6).

4. [20 pts.] Evaluate the integral:

$$\int_0^1 \left[\left(6te^{3t^2} \right) \vec{i} + \left(6e^{-6t} \right) \vec{j} + 5\pi \vec{k} \right] dt.$$

Give exact answers.

5. [20 pts.] Given the curve:

$$\vec{r}(t) = \left\langle -\sqrt{2}e^t \cos(t), -\sqrt{2}e^t \sin(t), 2 \right\rangle,$$

find:

a). The unit tangent vector $\vec{T}(t)$.

b). The unit normal vector $\vec{N}(t)$.

c). The curvature κ .

6. [10 pts.] Consider the curve:

$$\vec{r}(t) = \left<0, \cos^3(t), \sin^3(t)\right>, -\frac{\pi}{2} \le t \le 0.$$

Find the length of the curve on the given parameter domain.

October 1st, 2014. Math 2401; Sections D1, D2, D3. Georgia Institute of Technology Exam 2

I commit to uphold the ideals of honor and integrity by refusing to be tray 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	20	
2	15	
3	15	
4	15	
5	20	
6	15	
Total	100	

Remember that you must SHOW YOUR WORK to receive credit!

Good luck!

1. [20 points] Consider the function:

$$h(x,y) = \frac{x^2 + y}{y}$$

a. Find the limit of h(x,y) as $(x,y) \to (0,0)$ along linear paths y=kx.

b. Can you conclude from part a. that:

$$\lim_{(x,y)\to(0,0)} h(x,y) = 1?$$

Justify your answer briefly.

c. Find the limit of h(x,y) as $(x,y) \to (0,0)$ along parabolic paths $y=kx^2$.

d. What conclusions can you draw from the results you obtained in part c. about $\lim_{(x,y)\to(0,0)} h(x,y)$?