Name: _____

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

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	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!

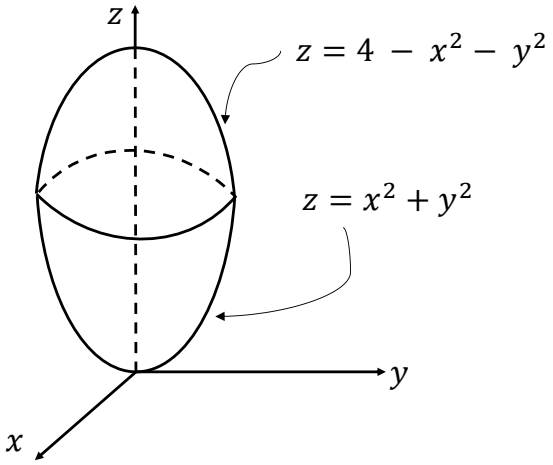
2. [20 points] Find:

$$\int_1^2 \int_1^{\sqrt{z}} \int_{\ln(x)}^{\ln(3x)} e^{x^2+y+z}\, dy\, dx\, dz.$$

5. [16 points] Using *cylindrical coordinates*, set up the triple integral to compute the volume of the solid enclosed by the two paraboloids:

$$z = 4 - x^2 - y^2;$$
$$z = x^2 + y^2,$$

pictured below. You do not have to compute the value of the integral.



Name: _____

April 15th, 2015.
Math 2401; Sections K1, K2, K3.
Georgia Institute of Technology
Exam 4

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
0	10	10
1	18	
2	18	
3	18	
4	18	
5	18	
Total	100	

Remember that you must SHOW YOUR WORK to receive credit!

Good luck!

1. [18 points] Find the line integral:

$$\int_C 3x\, ds,$$

where C is the portion of the parabola $y = x^2$ from $(0, 0)$ to $(3, 9)$.

2. [18 points] Find:

$$\oint_C \left(y + e^{\sqrt{x}}\right)\, dx + \left(2x + \cos y^2\right)\, dy,$$

where C is the positively oriented boundary of the region enclosed by the parabolas $y = x^2$ and $x = y^2$.

3. [18 points] Consider the conservative field:

$$\mathbf{F}(x,y,z) = (yz)\mathbf{i} + (xz - 2y\ln(z))\,\mathbf{j} + \left(xy - \frac{y^2}{z}\right)\mathbf{k}.$$

a). [12 points] Find a potential function for this field.
b). [6 points] Find $\int_C \mathbf{F}\cdot d\mathbf{r}$, where C is the curve:

$$\mathbf{r}(t) = \left\langle t, t^2, e^t \right\rangle, \ 0 \le t \le 1.$$

5. [18 points] Compute the area enclosed by the deltoid curve, pictured below, and parametrized by:

$$\mathbf{r}(\theta) = \langle 2\cos\theta + \cos(2\theta),\quad 2\sin\theta - \sin(2\theta)\rangle\,,\ \ 0 \le \theta \le 2\pi.$$

Reminders: $\sin(2\theta) = 2\sin\theta\cos\theta$ and $\cos(2\theta) = \cos^2\theta - \sin^2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta$.