**Calc 2 Practice Exam Supplement**

Here are a few supplementary questions involving mass, moments, and center of gravity. Any of these questions could appear on the exam 2 (or not).

1. Define the mass $m$, the moments $M\_{x}$, $M\_{y}$, and the center of gravity $(\overbar{x},\overbar{y})$ of a lamina D with density function $ρ(x,y)$
2. True/False
	1. If D is a lamina of uniform density in form of a rectangle from $\left(0,0\right)$ to $(2,4)$, then the center of gravity $\left(\overbar{x},\overbar{y}\right)=(1,2)$
	2. If D is a lamina bounded by the x-axis, the y-axis, and the line from (0, 2) to (1, 0) with density function $ρ\left(x,y\right)=x^{2}\sin(\left(y\right))\*\cos(\left(x^{2}+y^{2}\right))$ then the center of gravity is (1, 2)
3. Picture problem: identify the lamina with the larger second moment about the y-axis:
4. Find the mass and center of gravity of the lamina that occupies the region D and has the given density function:
	1. $D=\{\left(x,y\right) :0\leq x\leq 2, -1\leq y\leq 1\}$ and $ρ\left(x,y\right)=xy^{2}$
	2. D is the triangular region with vertices (0,0), (1,1), (4,0) and $ρ\left(x,y\right)=x$
	3. D is bounded by the parabola $x=y^{2}$ and the line $y=x-2$, and $ρ\left(x,y\right)=3$
	4. D is enclosed by the cardioid $r=1+cos⁡(θ)$ and $ρ\left(x,y\right)=\sqrt{x^{2}+y^{2}}$
	5. D is a thin lamina bounded by $y=\sqrt{2-x^{2}}$ and y = 0 with density function $ρ\left(x,y\right)=\frac{1}{x^{2}+y^{2}+1}$