PRACTICE QUIZ II

1. Let *R* be the region bounded by the line y = x + 6 and the parabola $y = x^2$. Assume that *R* is rotated about the line x = - 6. Using the method of shells, write an integral that expresses the volume of the solid of revolution generated by *R*. Do not evaluate the integral. Sketch!

2. Sketch the region in the first quadrant bounded by the x-axis, the y-axis, the line $x = \sqrt{3}$ and the curve $y = \sqrt{x^2 + 1}$. This region is rotated about the y-axis. Using the *shell method*, write a definite integral that expresses the volume of this solid of revolution. You *need not* evaluate this integral.

3. Let $\mathbb{R}$ be the region bounded by $y = 2x^2 - x^3$ and y = 0. Find the volume obtained by rotating $\mathbb{R}$ about the y–axis.

4. The following integral represents the volume of a solid of revolution. Describe the solid.

$$\int_0^1 2\pi(3-x)(1-x^2)dx$$

5. The region bounded by the curves $y = \sin^2 x$, $y = \sin^4 x$, for $0 \le x \le \pi$ is rotated about the axis $x = \pi/2$. Find the volume of the solid using shells. Sketch!

6. Find a parameterization of the circle centered at C = (7, 11) that has radius equal to 4. Choose the *clockwise* direction.

7. How many *complete cycles* will Charlotte make if she lives on the following parameterized curve: $x(t) = 5 \cos 20\pi$ $y(t) = 5 \sin 20\pi$ where $0 \le t \le 1$?

8. Find a parameterization of the line segment beginning at P = (-3, 4) and terminating at Q = (9, 9).

9. Sketch and identify the curve defined by the parametric equations:

$x(t) = 1 + 13 \cos t$, $y = 3 + 13 \sin t$, where $0 \le t \le \pi/2$?

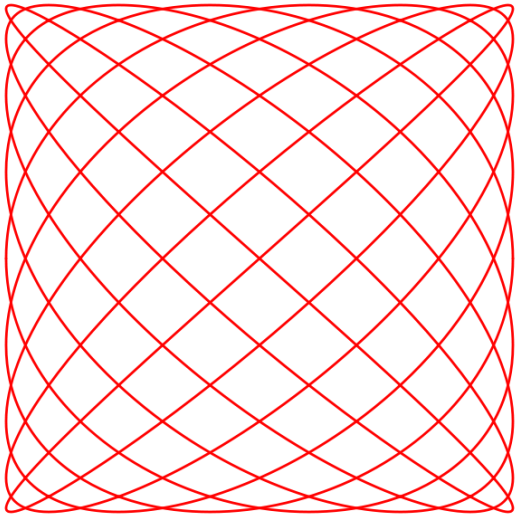
10. Parameterize *one cycle* of the curve $y = \sin 14x$.

11. Sketch (using a table) the curve defined by the parametric equations:

$$x(t) = t \cos t,\ \ y(t) = t \sin t,\ \ t > 0$$

12. Sketch and identify the curve defined by the parametric equations:

$$x(t) = t^2 - t,\ \ y(t) = 3t - 1$$



Lissajous figure parameterized by

$x(t) = 4 \sin (9t)$, $y(t) = 7 \sin (8t + \pi/2)$,

where $0 \leq t \leq 2\ \pi$

The limits of my language are the limits of my world.

- Wittgenstein, **Tractatus Logico-Philosophicus**