Calculus II
Practice Exam 4

1. Find the center, vertices and foci of the ellipse given by the equation $x^2 + 12y^2 - 6x = 15$.

2. Consider the parabola $y^2 = 16(x+1)$.
a) What are the coordinates of the vertex V and the focus F?
b) Find a point P on the parabola at which the tangent line makes an angle of $45°$ with the line joining P to F.

3. Find the equation of the hyperbola with vertices at $(-1,-3)$ and $(-1,5)$ and foci at $(-1,-4)$ amd $(-1,6)$.

4. Find an integral (do not try to evaluate it) giving the length of the curve $r = \sqrt{\cos(\theta)}$ from $\theta = -\pi/2$ to $\theta = \pi/2$.

5. Find the area swept out by the line segment $r = 1/\theta$ as θ ranges from 2π to 4π.