Homework 1

Math 352, Fall 2014

Due Date: Friday, September 5

1. An ellipse has foci at $(1, 1)$ and $(-1, -1)$, and the point $(2, 2)$ lies on its perimeter. Find an equation for this ellipse of the form

$$Ax^2 + Bxy + Cy^2 = D.$$

2. RollingAnimation.gif shows a unit circle rolling inside the circle $x^2 + y^2 = 16$. Find parametric equations for the indicated curve.

3. PivotAnimation.gif shows a bar of length 4π pivoting around the circle $x^2 + y^2 = 1$. Find parametric equations for the spiral traced out by the endpoint of the bar.

4. MovingSegment.gif shows a perpendicular line segment of unit length moving along the inside of the parabola $y = x^2$. Find parametric equations for the curve traced out by the other endpoint of the segment.