# Mathematics 21a Fall 2006
# In class problems. Oct. 10

1. Calculate the curvature of the ellipse $\frac{1}{4}x^2 + y^2 = 1$ at $(2, 0)$ and $(0, 1)$. What are the osculating circles at these two points? Hint: parameterize the ellipse by $\vec{r}(t) = \langle 2\cos t, \sin t \rangle$.

2. A particle moves along the helix $\vec{r}(t) = \langle \cos t^2, \sin t^2, t^2 \rangle,\ t \geq 0$. Calculate the acceleration vector and show that it is not orthogonal to the curve at any time $t > 0$.