

Your Name:

Duration of the Quiz is 10 minutes. There is only one problem, worth 20 points. Show all your work for full credit. Books, notes etc. are prohibited. Calculators are NOT permitted.

1. A particle travels along the curve  $C$  which is the intersection of the hyperboloid  $z = x^2 - y^2$  and the cylinder  $x^2 + y^2 = 1$ . Find a parameterization for the curve  $C$ , and compute the particle's velocity, acceleration and speed at time  $t = \frac{\pi}{4}$ .

**Hint:**  $\cos 2t = \cos^2 t - \sin^2 t$