Quiz #5; Wed, 2/24/2016

Math 53 with Prof. Stankova

Section 107; MWF10-11

GSI: Christopher Eur

Student Name: _____

Problem. Find the tangent vector to the curve parameterized by $\mathbf{r}(t) = \langle \cos t, \sin t, t \rangle$ at $t = \pi/2$.

Solution. $\mathbf{r}'(t) = \langle -\sin t, \cos t, 1 \rangle$, so at $t = \pi/2$, we have $\mathbf{r}'(\pi/2) = \langle -1, 0, 1 \rangle$. The tangent vector is thus $\frac{\mathbf{r}'(\pi/2)}{|\mathbf{r}'(\pi/2)|} = \frac{1}{\sqrt{1+1}}\mathbf{r}'(\pi/2) = \langle -\frac{1}{\sqrt{2}}, 0, \frac{1}{\sqrt{2}} \rangle$.