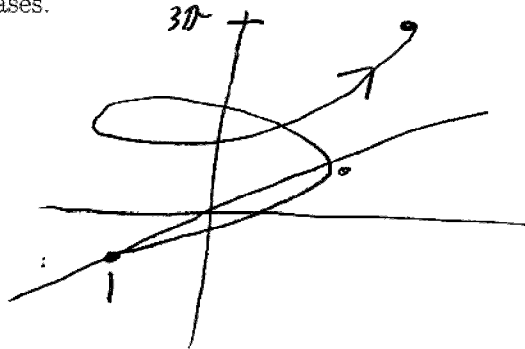


Name: SOLUTIONS

Quiz #4 - September 17, 2004

1. Sketch the curve  $\vec{r}(t) = (\cos t, \sin t, t)$  for  $0 \leq t \leq 3\pi$ . Indicate with an arrow the direction in which  $t$  increases.



2. Let  $\vec{u}$  be a differentiable vector function and  $f$  a real valued function. Then the chain rule says:

$$\frac{d}{dt}[\vec{u}(f(t))] = \vec{u}'(f(t)) \cdot f'(t)$$

3. Find the equation of the tangent line to the curve  $\vec{r}(t) = (t^2 - 1, t^2 + 1, t + 1)$  at the point  $(-1, 1, 1)$ .

$$\vec{r}'(t) = (2t, 2t, 1)$$

$(-1, 1, 1)$  is when  $t = 0$  so  $\vec{r}'(0) = (0, 0, 1)$

$$\langle x, y, z \rangle = (-1, 1, 1) + t(0, 0, 1)$$