Quiz 5 (Problems)

1. Using $r(t) = \langle \cos t, \sin t, t^2 \rangle$, $t = \frac{\pi}{2}$:
   a. Find the velocity vector.
   b. Find the acceleration vector.

2. A projectile is fired at a speed of 448 feet per second at and angle of 30 degrees from a tower 512 feet above the ground.
   a. Give the position vector for any time t.
   b. How far away will the object strike?

Quiz 5 (Answers)

1. (Math-252 Quiz 5)

   a. $\mathbf{v}(t) = \langle -\sin t, \cos t, 2t \rangle$
   $\mathbf{v}(\frac{\pi}{2}) = \langle -1, 0, \pi \rangle$

   b. $\mathbf{a}(t) = \langle -\cos t, -\sin t, 2 \rangle$
   $\mathbf{a}(\frac{\pi}{2}) = \langle 0, -1, 2 \rangle$

2. (Math-252 Quiz 5)

   a. $\mathbf{r}(t) = \langle 224\sqrt{3}t$
   $-16t^2 + 224t + 512 \rangle$

   b. $T = 16$
   $x(16) = 224\sqrt{3}(16) \doteq 6207.7$ feet