Name: _____

Show your work, or give reasoning, to receive full credit.

1. A moving object has velocity given by

$$\vec{v}(t) = \left\langle \frac{1}{\sqrt{2}}\cos(t),\ \sqrt{\frac{1}{2} - t^2},\ \frac{1}{\sqrt{2}}\sin(t) \right\rangle$$

   (a) (1 point) What is the speed of the object at time t?

   (b) (1 point) What is the total distance traveled by the object from $t = 0$ to $t = 1$?

Continue on to back side

2. (3 points) A moving object has velocity given by

$$\vec{r}(t) = \left\langle te^{t^2-1},\ t-7,\ 4 \right\rangle$$

(a) (1 point) Find the acceleration at time t.

(b) (1 point) Find the position at time t, assuming that the position is $\langle 0, 0, 0 \rangle$ at time $t = 0$.