Name _____

Homework 20
Section 17.1 & 17.2

1. (3ea) Determine a parameterization for each of the following.

   (a) The line through the points $(4, -1, -3)$ and $(1, 2, 4)$.

   (b) The circle of radius 6, parallel to the xz-plane, centered at $(-2, 5, 3)$.

   (c) The line segment from $(-5, 3, 2)$ to $(13, 1, 10)$.

2. (5) Determine a parameterization for the circle, traversed in the clockwise direction, which is inscribed in the square with corners at $(3, 1)$, $(7, 1)$, $(7, 5)$, and $(3, 5)$.

3. (1,1,2,2) Tommy is descending from the top of a spiral staircase. With x, y, and z in feet and the origin at the center of the base of the staircase, his position t minutes after he starts is given by the parameterization $\vec{r}(t) = (8\cos t)\vec{i} + (8\sin t)\vec{j} + (80 - 5t)\vec{k}$.

   (a) How tall is the staircase?

   (b) How long does it take him to reach the bottom?

   (c) What is his speed at time t?

   (d) What is the acceleration vector that represents his motion at time $t = 3$?