Supplementary Exercises for Section 12.1

1. What is the difference between the parametric curves $f(t) = \langle t, t, t^2 \rangle$, $g(t) = \langle \sin(t), \sin(t), \sin^2(t) \rangle$, and $h(t) = \langle t^2, t^2, t^4 \rangle$ as t runs over all real numbers?

2. Plot each of the curves below in 2 dimensions, looking at each directly on the x, y and z axes (you'll have 6 total plots)

   (a) $f(t) = \langle t, t^3, t^2 \rangle$, t goes over all real numbers

   (b) $f(t) = \langle t^2, t - 1, t^2 + 5 \rangle$ for $0 \leq t \leq 3$

3. Given points $A = (a_1, a_2, a_3)$ and $B = (b_1, b_2, b_3)$ give parametric equations for the line *segment* connecting a and b. Be sure and give appropriate t values.

4. With a parametric plot and a set of t values, we can associate a 'direction'. For example, the curve $\langle \cos t, \sin t \rangle$ is the unit circle traced counterclockwise. How can we amend a set of given parametric equations and t values to get the same curve, only traced backwards?