Math 2313, Test I

Name _____

1. Find the parametric equations of the line:

   a. perpendicular to the plane $2x - 3y + 4z - 8 = 0$ and through the point $(2, 0, 1)$
   answer: $x = 2 + 2t, y = -3t, z = 1 + 4t$

   b. through the points $(0, 1, 0), (2, 0, 2)$.
   answer: $x = 2t, y = 1 - t, z = 2t$

2. Find the angle between the two planes $x - y - z = 5$ and $x + 2y = 7$.
   answer: 105^o.

3. If $r(t) =< sin(\pi t^3), cos(\pi t^3), t^3 >$, find $r'(t)$.
   answer: $r'(t) =< 3\pi t^2 cos(\pi t^3), -3\pi t^2 sin(\pi t^3), 3t^2 >$

4. Find the length of the helix of problem 3, from $t = 0$ to $t = 1$.
   answer: $\int_0^1 3t^2\sqrt{\pi^2 + 1}dt = \sqrt{\pi^2 + 1}$

5. Find parametric equations for the tangent line to the helix of problem 3, at $(0, -1, 1)$.
   answer: $x = -3\pi t, y = -1, z = 1 + 3t$