Math 2313, Test I

Name _____

1. Find the angle between the vectors $< 1, -3, 1 >$ and $< 3, 5, -2 >$.
   answer: 133.2 degrees

2. Find the area of a triangle which has edges $u =< 4, -3, 2 >$ and $v =< 1, 5, -1 >$ and $u - v$.
   answer: 12.39

3. a. Find the equations of the line perpendicular to the plane $2x + 4y + 3z = 11$ and through the point $(-2, 1, 3)$.
   answer: $x = -2 + 2t, y = 1 + 4t, z = 3 + 3t$

   b. Find the equation of the plane perpendicular to the line $x = -1 + 2t, y = 3, z = 2 - 4t$ and through the point $(-2, 1, 3)$.
   answer: $2x - 4z + 16 = 0$

4. If $r''(t) =< 0, -16 >, r(0) =< 2, -1 >$ and $r'(0) =< -1, 2 >$ find $r(t)$.
answer: $r(t) =< 2 - t, -1 + 2t - 8t^2 >$

5. If $r(t) =< cos(t) + t\ sin(t), sin(t) - t\ cos(t), t^2 >$,

a. Find the arc length from $t = 0$ to $t = 2$.
answer: $2\sqrt{5}$

b. Find parametric equations for the tangent line to the curve at $t = \pi$.
answer: $x = -1 - \pi t, y = \pi, z = \pi^2 + 2\pi t$