MATH 251: Quiz 2

September 24, 2015

Name: _____ Sec: _____

1. Given the vectors $\vec{v} = \langle -1, 2, 1 \rangle$ and $\vec{w} = \langle 0, 2, 3 \rangle$.

(a) Write the equations of the lines $\vec{r}_1(t)$ and $\vec{r}_2(t)$ through the point $(2, 3, 1)$ with direction vectors $\vec{v}$ and $\vec{w}$ respectively.

(b) Compute $\vec{v} \times \vec{w}$.

(c) Find the equation (any form) of the plane through $(2, 3, 1)$ containing the vectors $\vec{v}$ and $\vec{w}$.

2. For $\vec{r}(t) = \langle t^2 - 1 + e^t, \sin(2t) + 4, e^{t^2} + t^3 - t \rangle$, compute

(a) $\lim_{t \to 1} \vec{r}(t)$.

(b) $\vec{r}'(t)$ as a function of t.

3. Parametrize the intersection of the cylinder $y^2 + z^2 = 9$ with the surface $3x + 4y^2 - z^2 = 4$.