Math 241H - Section 0301 - Fall 2017 Name:_____
Quiz 11-Review

You have all class to comlpete this. You may work in groups.

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1. **[3pts]** Consider the vectors $\mathbf{a} = 2\mathbf{i} + \mathbf{j} + 3\mathbf{k}$, $\mathbf{b} = \mathbf{i} + \mathbf{j} - \mathbf{k}$ and $\mathbf{c} = \mathbf{i} - \mathbf{j} + 9\mathbf{k}$.
   (a) Show that $\mathbf{a}$ and $\mathbf{b}$ are orthogonal and find the equation for the plane that passes through the origin and $\mathbf{a}$ and $\mathbf{b}$.
   (b) Show that $\mathbf{c}$ lies in the same plane as $\mathbf{a}$ and $\mathbf{b}$.
   (c) Resolve $\mathbf{b}$ into two two vectors one paralell to $\mathbf{a}$ and one parallel to $\mathbf{b}$.

2. **[2pts]** Consider the two planes $2x - 3y + 4z = 2$ and $x - z = 1$. Write the symmetric equations for the line ℓ that lies in the intersection of the planes.

3. **[2pts]** Find the distance D from the point $(1, -2, 5)$ to the line

$$x = 1 + 3t, \quad y = -2 - 4t, \quad z = 12t.$$

4. **[3pts]** Consider the vector valued function $\mathbf{r}(t) = e^t\mathbf{i} + e^t\mathbf{j} + \sqrt{2}\mathbf{k}$ find the tangential and normal components $a_{\mathbf{T}}$ $a_{\mathbf{N}}$ of the accelleration $\mathbf{a}$.