Quiz 1 **Calculus 3** **8/29/2012**

Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Suppose $\mathbf{v} = \langle 8,-4\rangle$ and $\mathbf{w} = \langle -4,6\rangle$. Express $3\mathbf{v} - \mathbf{w}$ in the form $\langle a, b\rangle$.

$3\langle 8,-4\rangle - \langle -4,6\rangle$

$= \langle 24,-12\rangle + \langle +4,-6\rangle$

$= \langle 28,-18\rangle$

Good!

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2. Consider the points $P(1,5,0)$ and $Q(0,7,2)$. Find two unit vectors parallel to $\overrightarrow{PQ}$, and write them in the form $a\mathbf{i} + b\mathbf{j} + c\mathbf{k}$.

$\frac{\overrightarrow{PQ}}{|\overrightarrow{PQ}|}$ Nice

$\overrightarrow{PQ} = \langle (0-1), (7-5), (2-0)\rangle$

$= \langle -1, 2, 2\rangle$

$|\overrightarrow{PQ}| = \sqrt{(-1)^2+2^2+2^2}$

$= \sqrt{9}$

$= 3$

$\frac{-1}{3}, \frac{2}{3}, \frac{2}{3}$

$-\frac{1}{3}\hat{i} + \frac{2}{3}\hat{j} + \frac{2}{3}\hat{k}$

$\frac{1}{3}\hat{i} - \frac{2}{3}\hat{j} - \frac{2}{3}\hat{k}$