Math 243 **Weekly Assignment 4** **DUE 09/23/2016**

Name: _____

Answer the questions on the worksheet and not on a separate sheet of paper. Please circle your answers and justify your work for full credit.

1. (a) If you are given two lines $\mathcal{H}$ and $\mathcal{L}$, what condition(s) on the lines will force the existence of a plane that contains both lines?

   (b) Consider the following two lines: one with parametric equations $x(s) = 4 - 2s$, $y(s) = -2 + s$, $z(s) = 1 + 3s$, and the other being the line through $(-4, 2, 17)$ in the direction $\mathbf{v} = \langle -2, 1, 5 \rangle$. If it exists, find an equation for the plane that contains both of the lines.

2. Consider the following two planes: one with scalar equation $4x - 5y + z = -2$, and the other which passes through the points $(1, 1, 1)$, $(0, 1, -1)$, and $(4, 2, -1)$. Determine parametric equations for the line of intersection of the two planes.

3. Find the distance between the plane $3x - 2y + z = 1$ and the line through the point $(1, 1, 1)$ in the direction of $\mathbf{v} = \langle 1, 1, -1 \rangle$.