Quiz # 1– Math 2163, Calculus III – Aug 31, 2007

Show all your work neatly and concisely, and indicate your final answer clearly.

1. (3pts) Find <u>symmetric equations</u> of the line through the origin and parallel to the line $x = 2t$, $y = 1 - t$, $z = 4 + 3t$.

   Solution: The line should pass through the origin $(0, 0, 0)$ and has the direction $< 2, -1, 3 >$. So its symmetric equation can be written as

   $$\frac{x - 0}{2} = \frac{y - 0}{-1} = \frac{z - 0}{3}.$$

   (You can find the formula of symmetric equation in page 859 of the textbook.)

2. (2pts) Find the <u>linear equation</u> of the plane through the point $(-2, 8, 10)$ and parallel to the plane $x + y + z = 2$.

   Solution: The plane should pass through point $(-2, 8, 10)$ and has a normal vector $< 1, 1, 1 >$. So its scaler equation should be

   $$1(x - (-2)) + 1(y - 8) + 1(z - 10) = 0.$$

   (See the formula on page 862 of the textbook.) Simplify the above equation and get

   $$x + y + z - 16 = 0.$$