

Show all work clearly and in order, and circle your final answers. Justify your answers.

PROBLEM ONE Find the equation of the plane containing the lines

$$\frac{x-2}{2} = \frac{y}{-2} = \frac{z-3}{4} \text{ and } x+1 = \frac{y+7}{4} = \frac{z+3}{2}.$$

Hint: Note the point (1,1,1) is on both lines (verify this!).

PROBLEM TWO (a) Find the limit as t goes to zero of the following vector function:

$$\vec{r}(t) = (t^2 + 1)\vec{i} + \sin(2t)\vec{j} + \left(\frac{t-1}{\ln(t+1)}\right)\vec{k}$$

(b) For the same vector function as is (a), find $\vec{r}'(t)$.