"QUIZ" for Lecture 3

E-MAILSCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q3FirstLast.pdf) ASAP BUT NO LATER THAN Sept. 15, 8:00pm

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P Q R

1. Find an equation of the plane that passes through the points $(0,1,1)$, $(1,0,1)$, $(1,1,0)$.

$\overrightarrow{PQ} = \langle 1,0,1\rangle - \langle 0,1,1\rangle = \langle 1,-1,0\rangle$

$\overrightarrow{PR} = \langle 1,1,0\rangle - \langle 0,1,1\rangle = \langle 1,0,-1\rangle$

$$\overrightarrow{PQ} \times \overrightarrow{PR} = \begin{vmatrix} i & j & k \\ 1 & -1 & 0 \\ 1 & 0 & -1 \end{vmatrix} = i((-1\cdot -1)-(0\cdot 0)) - j((1\cdot -1)-(1\cdot 0)) + k(1\cdot 0 - 1\cdot(-1))$$

$$= i(1-0) - j(-1-0) + k(0-(-1))$$

$$i + j + k \Longrightarrow \langle 1,1,1\rangle$$

$(x-0) + (y-1) + (z-1) = 0$

$\boxed{x + (y-1) + (z-1) = 0}$

2. Find the intersection of the line

$$\mathbf{r}(t) = \langle 1,1,0\rangle + t\langle 0,2,4\rangle$$

and the plane

$$x + y + z = 14 \quad .$$

$r(t) = \langle 1,1,0\rangle + t\langle 0,2,4\rangle$

$= \langle 1,1,0\rangle + \langle 0, 2t, 4t\rangle$

$= \langle 1, 1+2t+4t\rangle$

$x = 1 \quad y = 2t \quad z = 4t$

$1 + 2t + 4t = 14$

$6t = 13$

$t = \frac{13}{6}$

$1 + \frac{26}{6} \quad \frac{6}{6} \quad \frac{32}{6}$

$\frac{13}{4}$

$\frac{52}{}$

$\frac{16}{3}$

$\boxed{\langle 1, \frac{16}{3}, \frac{52}{6}\rangle}$