"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 NAME:

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

$a(x-x_0)+b(y-y_0)+c(z-z_0)=0$

$\vec{PQ} = (0,1,1) - (1,0,1) = \langle 1,-1,0\rangle a$

$\vec{QR} = (1,0,1) - (1,1,0) = \langle 0,-1,1\rangle b$

$\vec{PQ} \times \vec{QR} = \langle a_y b_z - a_z b_y, a_z b_x - a_x b_z, a_x b_y - a_y b_x \rangle$

$= \langle -1\cdot 1 - 0\cdot -1,\ 0\cdot 0 - 1\cdot 1,\ 1\cdot -1 - -1\cdot 0\rangle$

$= \langle -1-0,\ 0-1,\ -1-0\rangle$

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

a b c for earlier equation

$a(x-x_0)+b(y-y_0)+c(z-z_0)=0$

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

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

$-x-0-y+1-z+1=0 \longrightarrow$ simplify $\rightarrow$ $\boxed{x+y+z=2}$

2. Find the intersection of the line

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

and the plane

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

$x = 1+0t$
$y = 1+2t$
$z = 0+4t$

$\longrightarrow (1+0t)+(1+2t)+(0+4t)=14$

$1+1+2t+4t=14$

$2+6t=14$

$6t=12$

$t=2 \longrightarrow$

$x = 1+0(2)$
$y = 1+2(2)$
$z = 0+4(2)$

$\rightarrow \boxed{\langle 1, 5, 6\rangle}$