"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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1. Find an equation of the plane that passes through the points $\overset{P}{(0,1,1)}$, $\overset{Q}{(1,0,1)}$, $\overset{R}{(1,1,0)}$.

$u = \overrightarrow{PQ} = [1-0, 0-1, 1-1] = [1, -1, 0]$

$v = \overrightarrow{PR} = [1-0, 1-1, 0-1] = [1, 0, -1]$

$u \times v = [u_2v_3 - v_2u_3, v_1u_3 - u_1v_3, u_1v_2 - v_1u_2]$

$= [(-1)(-1) - (0)(0), (1)(0) - (1)(-1), (1)(0) - (1)(-1)]$

$= [1-0, 0+1, 1+1] = [1, 1, 2]$ (pick point P)

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

$x + y + 2z = 3$

2. Find the intersection of the line

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

and the plane

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

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

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

$2 + 6t = 14$

$t = 6$

$r(6) = \langle 1,1,0\rangle + 6\langle 0,2,4\rangle$

$= \langle 1,1,0\rangle + \langle 0,12,24\rangle$

$= (1, 13, 24)$