

“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:LiuyangShan

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

We assume that $a = (0, 1, 1)$ $b = (1, 0, 1)$ $c = (1, 1, 0)$

$$\vec{ab} = (1, -1, 0) \quad \vec{ac} = (1, 0, -1) \quad \vec{ac} \times \vec{ab} = \begin{vmatrix} i & j & k \\ 1 & -1 & 0 \\ 1 & 0 & -1 \end{vmatrix} = i + j + k = (1, 1, 1)$$

so the equation of the plane is $(x - 1) + (y - 1) + z = 0$

2. Find the intersection of the line $\mathbf{r}(t) = (1, 1, 0) + t(0, 2, 4)$ and the plane $x + y + z = 14$.

$$r(t) = \begin{cases} x = 1 \\ y = 2t + 1 \rightarrow 2y - z = 2. \\ z = 4t \end{cases}$$

When $x = 1$, the plane becomes a line: $y + z = 13$.

So the intersection is $(1, 5, 8)$.