

**“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  $(0, 1, 1)$ ,  $(1, 0, 1)$ ,  $(1, 1, 0)$ .

Let  $P(0, 1, 1)$   $Q(1, 0, 1)$   $R(1, 1, 0)$

$$u = PQ = Q - P = (1, -1, 0)$$

$$v = PR = R - P = (1, 0, -1)$$

$$u \cdot v = i \quad j \quad k$$

$$1 \quad -1 \quad 0$$

$$1 \quad 0 \quad -1$$

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

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

Pick the  $(0, 1, 1)$  as the point

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

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

$$x + y + z - 2 = 0$$

2. Find the intersection of the line

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

and the plane

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

change the line to  $x=1$   $y=1+2t$   $z=0+4t=4t$

sub to the plane

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

$$2 + 6t = 14$$

$$t = 2$$

sub  $t$  to  $x, y, z$

$$x = 1$$

$$y = 5$$

$$z = 8$$

the point is  $(1, 5, 8)$