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1. Find An Equation OF The PLANE that passes through the points $(0,1,1), (1,0,1), (1,1,0)$

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

$u = PQ = Q - P = [1,0,1] - [0,1,1] = [1,-1,0]$
$v = PR = R - P = [1,1,0] - [0,1,1] = [1,0,-1]$

Find The Cross Product: $[1,-1,0] \times [1,0,-1]$

$$\begin{matrix} i & j & k \\ 1 & -1 & 0 \\ 1 & 0 & -1 \end{matrix}$$

$i(1-0) - j(-1-0) + k(0-(-1))$
$= 1i + j + 1k \rightarrow [1, 1, 1]$

Point: $(0,1,1) \rightarrow (x-0)\cdot 1 + (y-1)\cdot 1 + (z-1)\cdot 1 = 0$
$\rightarrow (x) + (y-1) + (z-1) = 0$

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

$r(t) = \langle 1, 1+2t, 4t \rangle$
$x \quad y \quad z$

→ Substitute components into plane equation

$(1) + (1+2t) + (4t) = 14$
$2 + 6t = 14$
$-2 \qquad -2$
$6t = 12 \quad t = 2$

Back Track & plug 2 into parametric equation
$= \langle 1, 5, 8 \rangle = (1, 5, 8)$
↳ Point OF Intersection