Equation of a plane

1. Find the equation of the plane containing the three points $P_1 = (1, 0, 1)$, $P_2 = (0, 1, 1)$, $P_3 = (1, 1, 0)$.

$$\left[(-1,1,0) \times (0,1,-1)\right] \cdot (x, y, z) = 0$$

$$\begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ -1 & 1 & 0 \\ 0 & 1 & -1 \end{vmatrix} \cdot (x, y, z) \rightarrow$$

$$\hat{i}(-1) - \hat{j}(1) + \hat{k}(-1)$$

$$(-\hat{i} - \hat{j} - \hat{k}) \cdot (x-1, y, z-1) = 0$$

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

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

$$\boxed{x + y + z = 2}$$

18.02SC Multivariable Calculus
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