

Jinquan Lin

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

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

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

$$PQ \times PR = (1, 1, 1)$$

Pick $P(0, 1, 1)$ as favorite point

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

$$x + y + z = 2$$

2. $r(t) = (1, 1, 0) + t(0, 2, 4)$

$$= (\overset{1}{\cancel{1+t}}, 1+2t, 4t)$$

$$\overset{1}{\cancel{1+t}} + 1 + 2t + 4t = 14$$

$$12 = \overset{7}{\cancel{6}}t$$

$$t = \frac{12}{\cancel{6}} = 2$$

$$1+2t = 5, \quad 4t = 8$$

$$\cancel{x-1} (x-1) + (y-5) + (z-8) = 14$$

intersection is $(1, 5, 8)$

