(a) (4 pts) Find the equation of the plane through P, Q, and R.
(Give your answer in the scalar form $ax + by + cz + d = 0$.)

(a) Find the **equation of the plane** containing the two lines given by the parametric equations

$$L1: \begin{cases} x = 7 - 2t \\ y = 5 + t \\ z = 8 \end{cases} \qquad L2: \begin{cases} x = 7 + 4t \\ y = 5 - 3t \\ z = 8 + t \end{cases}$$

(a) Find the equation of the plane that contains the point $(1, -2, 3)$ and the line given by $x = 4t$, $y = 1 - t$, $z = 5 + 2t$.

(a) Find parametric equations for the line of intersection of the two planes $2x - y + 8z = 14$ and $2x - 2y + 4z = 2$.

(a) (2 pts) True or false, circle one for each statement:

- TRUE or FALSE : Two planes are always parallel or intersecting.
- TRUE or FALSE : Two planes perpendicular to a given plane must be parallel.

(b) (6 pts) Consider the line that contains the point $(5, 0, 0)$ and is orthogonal to the plane $3y-4z = 10$. Find the two points of intersection of this line with the paraboloid $20x = y^2+z^2$. (First find parametric equations for the line!)

Intersection Points: $(x, y, z) =$ _____

(c) (6 pts) Find an equation for the plane that passes through the point $(0, 0, 2)$ and contains the line of intersection of the planes $x + y - z = 1$ and $2x + y - 3z = -1$. And give the x-intercept of this new plane equation.

Plane Equation: _____

x-intercept: $(x, y, z) =$ _____