Test y and z by investigating their behavior at (i) $X_1 = 0$; (ii) $X_1 = X_0$; and what happens as (iii) $X_0 \to \infty$.

(i) If $X_1 = 0$ then ~~[illegible]~~ this will force the ~~the~~ point P_1 to be ~~[illegible]~~ the point P. $\boxed{P_1 = P}$

$y = \frac{-y_1 x_0}{x_1 - x_0}$; $z = \frac{-z_1 x_0}{x_1 - x_0}$

$y = \frac{-y_1 x_0}{0 - x_0}$ $\quad z = \frac{z_1(\cancel{-x_0})}{\cancel{0-x_0}}$

$y = \frac{y_1(\cancel{-x_0})}{\cancel{(-x_0)}}$ $\quad \boxed{z = z_1}$

$\boxed{y = y_1}$

(ii) If $x_1 = x_0$ then the vector will never pass through the yz-plane and y and z will be undefined.

Good

$y = \frac{-y_1 x_0}{x_1 - x_0}$ $\quad z$ is same as y

$y = \frac{-y_1 x_1}{x_1 - x_1}$ $\quad | \; x_1 = x_0$

$\boxed{y = \frac{-y_1 x_1}{0} \text{ undefined}}$

~~(iii) As $x_0 \to \infty$ y and z both approach 1, making the point P approach (0, 1, 1)~~

(Sorry) !

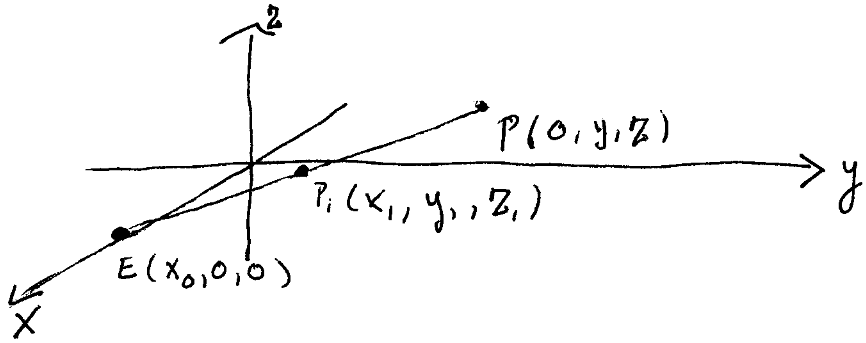
(iii) As $x_0 \to \infty$ ~~again~~ both y and z approach ~~become undefined~~ y_1 or z_1 ~~though until they actually reached infinity~~ respectively.
This happens because the amount x_1 is subtracting becomes null unless $x_1 \to \infty$. Otherwise the two will be close enough to make $\frac{x_0}{x_0} \approx 1$ making $y \to y_1$

Excellent job.

For the following problem I worked solo with only the aid of our text and my notes.

Pg 651

73) The Eye is at $E(X_0, 0, 0)$. We Want to portray the point $P_1(X_1, y_1, Z_1)$ on the yZ plane, this point will be $P(0, y, Z)$. The problem is to find y and Z given E and P_1.



a) Write a Vector equation that holds true between $\overrightarrow{EP}$ and $\overrightarrow{EP_1}$. Use the Equation to Express y and Z in terms of X_0, X_1, y_1, Z_1:

$$\overrightarrow{EP} = \overrightarrow{EP_1} + \overrightarrow{P_1P}$$

Now since we are trying to find $\overrightarrow{EP}$ that passes through the point P_1 a restriction is that $X_0 > X_1$ otherwise the vector will never pass through the yZ-plane. Thus the point P can be defined through the Parametric Equation of $\overrightarrow{EP_1}$ by defining t through the fact that x must always equal zero.

$$\overrightarrow{EP_1} = \langle X_1 - X_0, y_1 - 0, Z_1 - 0 \rangle$$
$$E(X_0, 0, 0)$$

$$(X, y, Z) = (X_0 + (X_1 - X_0)t, \; y_1 t, \; Z_1 t)$$

$$X = 0 = X_0 + (X_1 - X_0)t$$
$$-X_0 = (X_1 - X_0)t$$
$$t = \frac{-X_0}{X_1 - X_0}$$

Good!

$$\boxed{\begin{gathered} P(0, y, Z) = \left(0, \frac{-y_1 X_0}{X_1 - X_0}, \frac{-Z_1 X_0}{X_1 - X_0}\right) \\ \text{or} \\ y = \frac{-y_1 X_0}{X_1 - X_0} \; ; \; Z = \frac{-Z_1 X_0}{X_1 - X_0} \\ \text{if } X_0 > X_1 \text{ and } X = 0 \end{gathered}}$$