1. A light source is placed at $(0, 10, 0)$ and it casts shadows onto the horizontal plane $P$ defined by $y = 1$.

When $(x, y, z)$ is a point in $\mathbb{R}^3$ with $1 \leq y < 10$, define $A((x, y, z))$ to be the position of the shadow of the point on the plane $P$. For example, $A((1, 7, 2)) = (3, 1, 6)$, and $A((-2, 4, -4)) = (-3, 1, -6)$.

a. Working in ordinary coordinates (not homogeneous) give the formula expressing the mapping $A((x, y, z)) = (x', y', z')$. That is, give formulas for $x', y', z'$ in terms of $x, y, z$.

b. Give a $4 \times 4$-matrix that represents the transformation $A$ over homogeneous coordinates.