Step-1

$T(u,v,w)=(u+v+w,\, u+v,\, u)$ defined over $\mathbf{R}^3$

If the range and the co domain are equal, then the transformation will be invertible.

So, comparing the range vector with the co domain vector,

i.e., $(u+v+w,\, u+v,\, u)=(x,y,z)$

Then $z=u, y=u+v, x=u+v+w$

$\Rightarrow u=z, v=y-z, w=x-y$ â€¦â€¦ (1)

If T is invertible, we can write

$T(u,v,w)=(u+v+w,\, u+v,\, u)\Rightarrow T^{-1}(u+v+w,\, u+v,\, u)=(u,v,w)$

In view of (1), we can write $T^{-1}(x,y,z)=(z,y-z,x-y)$