1c.

i. $\pi_0 = (1, 0, 0, 0)$

. $R = \begin{vmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 1/2 & 0 & 0 & 1/2 \end{vmatrix}$

$\pi_\infty R = \pi_\infty$

let $\pi_\infty = (b, c, d, e)$

$\pi_\infty R = (e/2, b, c, d + e/2) \equiv (b, c, d, e)$

$e/2 = b = c$

$d + e/2 = e$

$d = 3/2\ e$

$\pi_\infty = \dfrac{(1, 1, 3, 2)}{7}$

ii. $a = 1$

since it permutes x in xR,

$\pi_\infty R = \pi_\infty$ would yield $(b, c, d, e) \equiv (e, b, c, d)$