The first question concerns an affine transformation \( g \) that transforms the cylinder on the left into the cylinder on the right. The cylinder on the left is vertical and centered at the origin; its center axis lies on the \( y \)-axis, and it has radius 1 and height 2. Thus the top of the cylinder has \( y = 1 \) and the bottom has \( y = -1 \). The cylinder on the right is horizontal and centered at \((2,0,0)\); its center axis lies on the \( x \)-axis, and it has radius \( \frac{1}{2} \) and length 4. Thus the right end of this cylinder has \( x = 4 \) and the left end has \( x = 0 \).

**Question 1.** Express \( g \) as a composition of rotations \( R_{\theta, u} \), scalings \( S_{(a,b,c)} \) and translations \( T_u \). (There is more than one possible correct answer.)

**Question 2.** Give the \( 4 \times 4 \) matrix that represents the rotation \( R_{-\pi/2, k} \). (You might have used this rotation in your answer to question 1.)