The e vectors belonging to $\lambda = -1$

$$A + I = \begin{bmatrix} \frac{3}{2} & \frac{\sqrt{3}}{2} \\ \frac{\sqrt{3}}{2} & \frac{1}{2} \end{bmatrix} \quad \begin{bmatrix} \frac{3}{2} & \frac{\sqrt{3}}{2} \\ 0 & 0 \end{bmatrix} \quad \begin{bmatrix} 1 & \frac{1}{\sqrt{3}} \\ 0 & 0 \end{bmatrix}$$

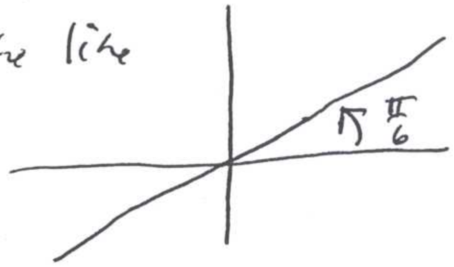
$R_2 \mapsto -\frac{1}{\sqrt{3}} R_1 + R_2 \qquad R_1 \mapsto \frac{2}{3} R_1$

So $x_1 = -\frac{1}{\sqrt{3}} x_2$

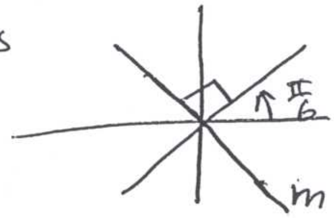
x_2 arbitrary

So the e. vectors belonging to $\lambda = -1$ are $\left\{ c \begin{bmatrix} 1 \\ -\sqrt{3} \end{bmatrix} \middle| \; c \in R \right\}$

By the way, multiplication by A is reflection across the line



and our calculations confirm that A leaves the indicated line alone but sends vectors



on m to minus themselves.