Section 3.12. In #16, refer to Figure 12.1. The left k becomes $4k$, the center k becomes $2k$, and the right k remains k. If we rename the coordinates x, y as x_1, x_2 as we did in class, the vector equation of motion for the coupled mass-spring system is

$$m\frac{d^2}{dt^2}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = k \begin{pmatrix} -6 & 2 \\ 2 & -3 \end{pmatrix}\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}.$$

Find the normal frequencies and normal modes of vibration. Describe in words the normal modes of vibration.