Attendance Quiz for Lecture 22

1. (a) Find the QR decomposition of

$$A = \begin{bmatrix} 1 & 1 \\ -2 & -1 \\ 1 & 0 \end{bmatrix}$$

(b) Verify that indeed $A = QR$.

Hint: In the interest of time, you were given the answer to Lecture 21's attendance quiz.

Using Gram-Schmidt , an orthonormal basis with the same span as the set

$$\left\{ \begin{bmatrix} 1 \\ -2 \\ 1 \end{bmatrix} , \begin{bmatrix} 1 \\ -1 \\ 0 \end{bmatrix} \right\} ,$$

is

$$\left\{ \begin{bmatrix} \frac{\sqrt{6}}{6} \\ -\frac{2\sqrt{6}}{6} \\ \frac{\sqrt{6}}{6} \end{bmatrix} , \begin{bmatrix} \frac{\sqrt{2}}{2} \\ 0 \\ -\frac{\sqrt{2}}{2} \end{bmatrix} . \right\} .$$