Name: _____ Sort #: _____

Worksheet 9

The Fundamental Subspaces MATH 2250, Fall 2018

1. For the given matrices determine whether the given vector is in the column space of the matrix. If so, express the vector as a linear combination of the column vectors of the matrix. Use your calculator to perform any matrix calculations.

   (a)

$$A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 1 & 3 \end{bmatrix}; \qquad \mathbf{b} = \begin{bmatrix} -1 \\ 0 \\ 2 \end{bmatrix}$$

(b)

$$B = \begin{bmatrix} 1 & -1 & 1 \\ 9 & 3 & 1 \\ 1 & 1 & 1 \end{bmatrix}; \qquad \mathbf{c} = \begin{bmatrix} 5 \\ 1 \\ -1 \end{bmatrix}$$

2. Find Null(A) for the following matrices. Use your calculator to perform any matrix calculations.

   (a) $A = \begin{bmatrix} 1 & -6 & 4 & 0 \\ 0 & 0 & 2 & 0 \end{bmatrix}$

(b) $B = \begin{bmatrix} 1 & 5 & -4 & -3 & 1 \\ 0 & 1 & -2 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix}$