

# Math 54 Quiz 8

October 16, 2015

- (a) Let  $B = \left\{ b_1 = \begin{bmatrix} 1 \\ 3 \end{bmatrix}, b_2 = \begin{bmatrix} 2 \\ 1 \end{bmatrix} \right\}$  and  $C = \left\{ c_1 = \begin{bmatrix} -1 \\ 3 \end{bmatrix}, c_2 = \begin{bmatrix} -2 \\ 1 \end{bmatrix} \right\}$  be bases of  $\mathbb{R}^2$ .  
Find the change-of-coordinates matrix from  $B$  to  $C$ .

(b) Let  $x = \begin{bmatrix} 5 \\ 10 \end{bmatrix}$ . Using the fact that  $[x]_B = \begin{bmatrix} 3 \\ 1 \end{bmatrix}$ , find the coordinates of  $x$  with respect to the  $C$  basis.

- Find the eigenvalues of  $x = \begin{bmatrix} 3 & 4 \\ 3 & 2 \end{bmatrix}$  and one corresponding eigenvector for each eigenvalue.