MTH 302: Linear Algebra and Differential Equations

Activities for Thursday, 9 February 2023

Part 1

1. Find the eigenvalues and eigenvectors of the matrix $A = \begin{bmatrix} -4 & 4 \\ -12 & 10 \end{bmatrix}$.
2. Find just the eigenvalues (not the vectors) for $B = \begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ from the Class Prep. Remind yourself of the visual effect of multiplying by this matrix; in that light, why does your result about eigenvalues make sense?
3. Find just the eigenvalues (not the vectors) for $C = \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ from the Class Prep. Remind yourself of the visual effect of multiplying by this matrix; in that light, why does your result about eigenvalues make sense?

Part 2

There's a trick for finding the eigenvalues of an *upper triangular* matrix. Go generate several of these using the function for randomly generating upper-triangular matrices (see the Resource Page entry for February 7). Look at the matrix after it's generated, then find its eigenvalues. What do you notice?