Name:_____

**MATH 320: QUIZ 6**

(1) (4 points) Compute the largest eigenvalue and its corresponding eigenvector using three iterations of the power method for the matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 3 \\ 1 & 0 & 1 \end{bmatrix}.$$

Let $x_0 = [1, 1/2, 1/4]$ and iterate $x_{i+1} = Ax_i/\lambda_i$, where $\lambda_i$ = largest coordinate of $Ax_i$. Please compute $x_3$ and $\lambda_3$.

(2) (3 points) Write down a matrix whose characteristic polynomial is $x^3 + 5x^2 - x + 1$.

(3) (3 points) Compute the following vector norms for the vector $[3, -2, 1, 4]$:
   (a) 1-norm,
   (b) 2-norm,
   (c) $\infty$-norm.