**Math 10B with Professor Stankova**
**Quiz 13; Tuesday, 4/24/2018**
**Section #203; Time: 9:30 AM**
**GSI name: Roy Zhao** **Name:** _____

Circle True or False or leave blank. (1 point for correct answer, $-1$ for incorrect answer, 0 if left blank)

1. True False If $\det(A) = 0$, we need to use Gaussian elimination to determine if $A\vec{v} = \vec{0}$ has 0 or $\infty$ solutions.
2. True False If $\det(A) = 0$, then 0 is an eigenvalue for $A$.

Show your work and justify your answers. Please circle or box your final answer.

3. (10 points) (a) (6 points) Let $A = \begin{pmatrix} 0 & -1 & 2 \\ 1 & 1 & 0 \\ 1 & 1 & 1 \end{pmatrix}$. Calculate $A^{-1}$ using Gaussian elimination.

(b) (1 point) Let $\vec{y} = \begin{pmatrix} y_1(t) \\ y_2(t) \end{pmatrix}$. Find the matrix $B$ that such that $\vec{y}' = B\vec{y}$ given

$$\begin{cases} y_1'(t) = y_1(t) + 2y_2(t) \\ y_2'(t) = y_1(t) \end{cases}$$

(c) (3 points) Find the eigenvalues and eigenvectors of the matrix $B$ found above.