

## Math 346: Linear Algebra: Take Home Quiz 1

Name: \_\_\_\_\_

**Instructions:** Solve these problems without discussing with other people. Cite any sources you use other than the textbook.

1. (5 points) Find a  $3 \times 3$  matrix  $A$  so that

$$A \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} y + z \\ x \\ y \end{pmatrix} \quad \text{for all real numbers } x, y \text{ and } z.$$

2. Consider the linear system
- $$\begin{array}{rcl} 2x + y & = & 0 \\ -2x - 3z & = & 1 \\ 6x + y + 8z & = & 2. \end{array}$$

- (a) (5 points) What is the augmented matrix of the system?
- (b) (5 points) Apply elimination to the augmented matrix until it has the form  $[U : \mathbf{c}]$  where  $U$  is an upper triangular matrix.
- (c) (5 points) Apply back substitution to solve the system. (Check your answer against the system!)