

**MATH221**  
quiz #2, 03/24/20  
Solutions  
Total 100

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Show all work legibly.

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

1. (20) Let  $A = \begin{bmatrix} 2 & -2 \\ -2 & 3 \end{bmatrix}$ , and  $B = \begin{bmatrix} 3 & 2 \\ 2 & 2 \end{bmatrix}$ . Compute  $AB$ .

$AB =$

2. (40) Let  $A = \begin{bmatrix} 2 & -2 \\ -2 & 3 \end{bmatrix}$ .

(a) (20) Find  $A^{-1}$  if exists.

$$A^{-1} =$$

(b) (20) Solve the matrix system of equations  $AX = B$  where  $B = \begin{bmatrix} 1 & -1 \\ -1 & 1 \end{bmatrix}$ .

$$X =$$

3. (20) Let  $A$  be an invertible matrix. True or False? If  $\{A\mathbf{u}_1, \dots, A\mathbf{u}_n\}$  is a linearly independent set, then the vector set  $\{\mathbf{u}_1, \dots, \mathbf{u}_n\}$  is linearly independent.

Mark one and explain.

- True       False

4. (20) Let  $A = [\mathbf{a}_1, \mathbf{a}_2, \mathbf{a}_3]$  be a  $2 \times 3$  matrix. True or False? If columns of  $A$  are linearly independent, then the system  $A\mathbf{x} = \mathbf{b}$  is consistent for each  $\mathbf{b}$ .

Mark one and explain.

- True       False

5. (20) Let  $A$  be an  $n \times n$  invertible matrix. True or False? If  $B$  is an  $n \times n$  matrix, and  $AB$  is invertible, then  $B$  is invertible.

Mark one and explain.

- True       False