CS 422 Quiz 1   Name _____

1. Are the following two vectors perpendicular? Explain briefly. (2 points)

$$\begin{bmatrix} 0 \\ 7 \\ 2 \end{bmatrix} \begin{bmatrix} 3 \\ -1 \\ 4 \end{bmatrix}$$

2. Is the following matrix invertible? Briefly explain. (3 points)

$$A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$$

3. Find the gradient of f at $(1, 1, 1)$. (5 points)

$$f(x, y, z) = x^3 z^2 + xy^2 + 3z^4 + x + 5$$

Useful Formulas

$$\begin{bmatrix} a & b \\ c & d \end{bmatrix}^{-1} = \frac{1}{ad - bc} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

CS 622 Quiz 1   Name _____

1. Are the following two vectors perpendicular? Explain briefly. (2 points)

$$\begin{bmatrix} 0 \\ 7 \\ 2 \end{bmatrix} \begin{bmatrix} 3 \\ -1 \\ 4 \end{bmatrix}$$

2. Show that matrix multiplication is not commutative. That is $AB \neq BA$. (5 points)

3. Find the gradient of f. (3 points)

$$f(x, y, z) = x^3 z^2 + xy^2 + 3z^4 + x + 5$$