M118
FALL 2009

QUIZ 8

NAME _____

1) (20 PTS.) Calculate

$$\begin{pmatrix} 0 & 2 \\ 1 & 0 \end{pmatrix}\left[\begin{pmatrix} 4 & 7 & 9 \\ 4 & 5 & 6 \end{pmatrix} - \begin{pmatrix} 0 & 0 & -2 \\ 0 & 3 & 0 \end{pmatrix}\right]$$

$$= \begin{pmatrix} 0 & 2 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} 4 & 7 & 11 \\ 4 & 2 & 6 \end{pmatrix} = \begin{pmatrix} 8 & 4 & 12 \\ 4 & 7 & 11 \end{pmatrix}$$

Answer (fill in the blanks): $\begin{pmatrix} 8 & 4 & 12 \\ 4 & 7 & 11 \end{pmatrix}$

SEE OTHER SIDE

2) (30 PTS.) Find the inverse of the following matrix:

$$\begin{pmatrix} 1 & 1 & 4 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix}$$

$$\left(\begin{array}{ccc|ccc} 1 & 1 & 4 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right) \xrightarrow{-1R_2+R_1} \left(\begin{array}{ccc|ccc} 1 & 0 & 4 & 1 & -1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{-2R_3+R_1} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & -1 & -2 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right) \xrightarrow{\frac{1}{2}R_3} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & -1 & -2 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1/2 \end{array}\right)$$

Answer (fill in the blanks): $\begin{pmatrix} 1 & -1 & -2 \\ 0 & 1 & 0 \\ 0 & 0 & 1/2 \end{pmatrix}$

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1) (20 PTS.) Calculate

$$\begin{pmatrix} 0 & 2 \\ 1 & 0 \end{pmatrix}\left[\begin{pmatrix} 4 & 7 & 9 \\ 4 & 5 & 6 \end{pmatrix} - \begin{pmatrix} 0 & 1 & -2 \\ 0 & 3 & 0 \end{pmatrix}\right]$$

$$\begin{pmatrix} 0 & 2 \\ 1 & 0 \end{pmatrix}\begin{pmatrix} 4 & 6 & 11 \\ 4 & 2 & 6 \end{pmatrix} = \begin{pmatrix} 8 & 4 & 12 \\ 4 & 6 & 11 \end{pmatrix}$$

Answer (fill in the blanks): $\begin{pmatrix} 8 & 4 & 12 \\ 4 & 6 & 11 \end{pmatrix}$

SEE OTHER SIDE

2) (30 PTS.) Find the inverse of the following matrix:

$$\begin{pmatrix} 1 & 1 & 6 \\ 0 & 1 & 0 \\ 0 & 0 & 2 \end{pmatrix}$$

$$\left(\begin{array}{ccc|ccc} 1 & 1 & 6 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right) \xrightarrow{-1R_2+R_1} \left(\begin{array}{ccc|ccc} 1 & 0 & 6 & 1 & -1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right)$$

$$\xrightarrow{-3R_3+R_1} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & -1 & -3 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 2 & 0 & 0 & 1 \end{array}\right) \xrightarrow{\frac{1}{2}R_3} \left(\begin{array}{ccc|ccc} 1 & 0 & 0 & 1 & -1 & -3 \\ 0 & 1 & 0 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 0 & 1/2 \end{array}\right)$$

Answer (fill in the blanks): $\begin{pmatrix} 1 & -1 & -3 \\ 0 & 1 & 0 \\ 0 & 0 & 1/2 \end{pmatrix}$