1) Calculate inverse matrix of the following matrices

A. $\begin{pmatrix} 1 & 1 \\ -1 & 0 \end{pmatrix}$

B. $\begin{pmatrix} 2 & 1 \\ 1 & 2 \end{pmatrix}$

C. $\begin{pmatrix} -2 & 2 \\ 2 & -2 \end{pmatrix}$

D. $\begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}$

E. $\begin{pmatrix} -1 & 1 \\ 1 & 1 \end{pmatrix}$

2) Which choice is the inverse matrix of the following matrix? Explain your result.

$$\begin{pmatrix} 2 & 1 & -3 & 1 & 1 \\ 0 & -1 & 2 & 1 & 2 \\ 0 & 0 & 1 & 2 & 3 \\ 0 & 0 & 0 & 4 & 8 \\ 0 & 0 & 0 & 0 & 2 \end{pmatrix}$$

A. $\begin{pmatrix} 1 & 1 & 1 & -1 & 1 \\ 0 & -2 & 4 & -3/2 & 2 \\ 0 & 0 & 2 & -1 & 1 \\ 0 & 0 & 0 & 1/2 & -2 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

B. $1/2\begin{pmatrix} 1 & 1 & 1 & -1 & 1 \\ 0 & -2 & 4 & -3/2 & 2 \\ 0 & 0 & 2 & -1 & 1 \\ 0 & 0 & 0 & 1/2 & -2 \\ 0 & 0 & 0 & 0 & 1 \end{pmatrix}$

C. $\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 1 & -2 & 0 & 0 & 0 \\ 1 & 4 & 2 & 0 & 0 \\ -1 & -3/2 & -1 & 1/2 & 0 \\ 1 & 2 & 1 & -2 & 1 \end{pmatrix}$

D. $1/2\begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ 1 & -2 & 0 & 0 & 0 \\ 1 & 4 & 2 & 0 & 0 \\ -1 & -3/2 & -1 & 1/2 & 0 \\ 1 & 2 & 1 & -2 & 1 \end{pmatrix}$

3) Find values of a and b in the following equation.

$$\frac{1}{2}\begin{pmatrix} 1 & -2 & 0 \\ 4 & 6 & 1 \\ 6 & 8 & 0 \\ 0 & 0 & 1 \end{pmatrix} -2\begin{pmatrix} 0 & 1 & -1 \\ 2 & 1 & 1 \\ 3 & 0 & a-b \\ 2 & a+b & 0 \end{pmatrix} = \begin{pmatrix} 1/2 & -3 & 2 \\ -2 & 1 & -3/2 \\ -3 & 4 & 0 \\ -4 & 2 & 1/2 \end{pmatrix}$$