The inverse of a matrix – Homework

Exercise   Calculate the inverse of the following matrices.

$$A = \begin{pmatrix} 1 & -2 \\ 2 & -5 \end{pmatrix} \quad B = \begin{pmatrix} 1 & -1 \\ -1 & 4 \end{pmatrix} \quad C = \begin{pmatrix} 2 & 3 & 1 \\ 0 & 2 & -1 \\ 1 & 2 & 3 \end{pmatrix} \quad D = \begin{pmatrix} 1 & 2 & -5 \\ -1 & 1 & -4 \\ 3 & 5 & -12 \end{pmatrix}$$

$$E = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \quad F = \begin{pmatrix} 1 & 0 & 1 \\ 1 & 1 & 0 \\ 0 & 1 & 1 \end{pmatrix} \quad G = \begin{pmatrix} 1 & 0 & 2 \\ 0 & 3 & 4 \\ 1 & 1 & 1 \end{pmatrix} \quad H = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$

Solutions:

$$A^{-1} = \begin{pmatrix} 5 & -2 \\ 2 & -1 \end{pmatrix}, \ B^{-1} = \frac{1}{3}\begin{pmatrix} 4 & 1 \\ 1 & 1 \end{pmatrix}, \ C^{-1} = \frac{1}{11}\begin{pmatrix} 8 & -7 & -5 \\ -1 & 5 & 2 \\ -2 & -1 & 4 \end{pmatrix}, \ D^{-1}: \ \text{doesn't exist},$$

$$E^{-1} = E, \ F^{-1} = \frac{1}{2}\begin{pmatrix} 1 & 1 & -1 \\ -1 & 1 & 1 \\ 1 & -1 & 1 \end{pmatrix}, \ G^{-1} = \frac{1}{7}\begin{pmatrix} 1 & -2 & 6 \\ -4 & 1 & 4 \\ 3 & 1 & -3 \end{pmatrix}, \ H^{-1}: \ \text{doesn't exist}$$