

Exercices 5 p. 41 # 1ace, 6ac

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1. a) La matrice B représente-t-elle l'inverse de la matrice A ?

$$A = \begin{bmatrix} 1 & 0 & 2 \\ 1 & 1 & 0 \\ 1 & -1 & 2 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 1 & 1 \\ 1 & 0 & -1 \\ 1 & -1/2 & -1/2 \end{bmatrix}$$

$$A \times B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}, \text{ oui}$$

c) La matrice F représente-t-elle l'inverse de la matrice E ?

$$E = \begin{bmatrix} 4 & -1 \\ -3 & 1 \end{bmatrix} \quad F = \begin{bmatrix} 1 & 1 \\ 3 & 4 \end{bmatrix}$$

$$E \times F = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \text{ oui}$$

e) La matrice Y représente-t-elle l'inverse de la matrice X ?

$$X = \begin{bmatrix} 2 & 1 \\ 1 & -1 \end{bmatrix} \quad Y = \begin{bmatrix} 1/3 & 1/3 \\ 1/3 & -2/3 \end{bmatrix}$$

$$X \times Y = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, \text{ oui}$$

6. Trouve l'inverse des matrices suivantes.

a) $\begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$ $\begin{array}{l} (1) \\ (2) \end{array} \left[\begin{array}{cc|cc} 4 & 3 & 1 & 0 \\ 2 & 1 & 0 & 1 \end{array} \right]$

$$\begin{array}{l} (1) \\ (1) - (2) \times 2 \end{array} \left[\begin{array}{cc|cc} 4 & 3 & 1 & 0 \\ 0 & 1 & 1 & -2 \end{array} \right]$$

$$\begin{array}{l} (1) - (2) \times 3 \\ (2) \end{array} \left[\begin{array}{cc|cc} 4 & 0 & -2 & 6 \\ 0 & 1 & 1 & -2 \end{array} \right]$$

$$\begin{array}{l} (1) \div 4 \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 0 & -1/2 & 3/2 \\ 0 & 1 & 1 & -2 \end{array} \right]$$

b) $\begin{bmatrix} 3 & 7 \\ 5 & 4 \end{bmatrix}$ $\begin{array}{l} (1) \\ (2) \end{array} \left[\begin{array}{cc|cc} 3 & 7 & 1 & 0 \\ 5 & 4 & 0 & 1 \end{array} \right]$

$$\begin{array}{l} (1) \\ (1) \times 5 - (2) \times 3 \end{array} \left[\begin{array}{cc|cc} 3 & 7 & 1 & 0 \\ 0 & 23 & 5 & -3 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (2) \div 23 \end{array} \left[\begin{array}{cc|cc} 3 & 7 & 1 & 0 \\ 0 & 1 & 5/23 & -3/23 \end{array} \right]$$

$$\begin{array}{l} (1) - (2) \times 7 \\ (2) \end{array} \left[\begin{array}{cc|cc} 3 & 0 & -12/23 & 21/23 \\ 0 & 1 & 5/23 & -3/23 \end{array} \right]$$

$$\begin{array}{l} (1) \div 3 \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 0 & -4/23 & 7/23 \\ 0 & 1 & 5/23 & -3/23 \end{array} \right]$$

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$$c) \begin{bmatrix} 1 & 1 \\ 3 & 4 \end{bmatrix}$$

$$\begin{array}{l} (1) \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 1 & 1 & 0 \\ 3 & 4 & 0 & 1 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (1) \times 3 - (2) \end{array} \left[\begin{array}{cc|cc} 1 & 1 & 1 & 0 \\ 0 & -1 & 3 & -1 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (2) \div -1 \end{array} \left[\begin{array}{cc|cc} 1 & 1 & 1 & 0 \\ 0 & 1 & -3 & 1 \end{array} \right]$$

$$\begin{array}{l} (1) - (2) \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 0 & 4 & -1 \\ 0 & 1 & -3 & 1 \end{array} \right]$$

$$d) \begin{bmatrix} 5 & 3 \\ 3 & 2 \end{bmatrix}$$

$$\begin{array}{l} (1) \\ (2) \end{array} \left[\begin{array}{cc|cc} 5 & 3 & 1 & 0 \\ 3 & 2 & 0 & 1 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (1) \times 3 - (2) \times 5 \end{array} \left[\begin{array}{cc|cc} 5 & 3 & 1 & 0 \\ 0 & -1 & 3 & -5 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (2) \div -1 \end{array} \left[\begin{array}{cc|cc} 5 & 3 & 1 & 0 \\ 0 & 1 & -3 & 5 \end{array} \right]$$

$$\begin{array}{l} (1) - (2) \times 3 \\ (2) \end{array} \left[\begin{array}{cc|cc} 5 & 0 & 10 & -15 \\ 0 & 1 & -3 & 5 \end{array} \right]$$

$$\begin{array}{l} (1) \div 5 \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 0 & 2 & -3 \\ 0 & 1 & -3 & 5 \end{array} \right]$$

$$e) \begin{bmatrix} 1 & 2 \\ 3 & -4 \end{bmatrix}$$

$$\begin{array}{l} (1) \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 3 & -4 & 0 & 1 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (1) \times 3 - (2) \end{array} \left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & 10 & 3 & -1 \end{array} \right]$$

$$\begin{array}{l} (1) \\ (2) \div 10 \end{array} \left[\begin{array}{cc|cc} 1 & 2 & 1 & 0 \\ 0 & 1 & \frac{3}{10} & -\frac{1}{10} \end{array} \right]$$

$$\begin{array}{l} (1) - (2) \times 2 \\ (2) \end{array} \left[\begin{array}{cc|cc} 1 & 0 & \frac{2}{5} & \frac{1}{5} \\ 0 & 1 & \frac{3}{10} & -\frac{1}{10} \end{array} \right]$$