

Solutions to (some) of worksheet 2-9

Friday, February 9, 2018 1:29 PM

3. (a) true

$$(AB)^{-1} = B^{-1}A^{-1}$$

(b) true

$$A \text{ invertible} \Rightarrow \text{REF}(A) = I$$

\Rightarrow onto & one-to-one

every row
has a pivot

every column
has a pivot

(c) False

$$A = I, B = -I$$

$$A + B = O \text{ (not invertible)}$$

4. (a) true

$$AA^{-1} = I$$

$$\det(AA^{-1}) = \det(I)$$

$$\det(A)\det(A^{-1}) = 1 \Rightarrow \det(A^{-1}) = \frac{1}{\det(A)}$$

(b) false

$$A = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}, \quad B = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}, \quad A+B = \begin{bmatrix} 2 & 2 \\ 0 & 4 \end{bmatrix}$$

$$\det(A) + \det(B) = 6 + 0 = 6$$

$$\det(A+B) = 8$$

(c) true

$$\text{col}(B) \text{ LD} \Rightarrow \text{col}(AB) \text{ LD (HW)}$$

$$\Rightarrow AB \text{ not invertible}$$

$$\Rightarrow \det(AB) = 0$$

why?

· what is REF(AB)?

· det of upper triangular

(d) false

example in (b) works.