HO 3

Jan. 2014

a

$$A = \begin{pmatrix} 3 & -2 & 4 \\ 1 & 0 & 2 \\ 0 & 1 & 0 \end{pmatrix} \qquad B = \begin{bmatrix} -1 & 1 & 2 \\ 0 & 2 & 0 \\ -1 & 1 & 4 \end{bmatrix}$$

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

$$B = \begin{pmatrix} -1 & 1 & 2 \\ 0 & 2 & 0 \\ -2 & 1 & 4 \end{pmatrix} \begin{matrix} -2 & 4 & -2 \\ 2 & 0 & 4 \\ -5 & 8 & -6 \end{matrix} \qquad BA = \begin{pmatrix} -2 & 4 & -2 \\ 2 & 0 & 4 \\ -5 & 8 & -6 \end{pmatrix}$$

b))

V ha Sarrus finder $|A|$

$$\begin{matrix} 3 & -2 & 4 & 3 & -2 \\ 1 & 0 & 2 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 \end{matrix} = 4 - 6 = -2$$

$|A| = -2$, derfor er A invertibel

c)

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

$$\begin{pmatrix} 0 & 0 & -2 & 1 & -3 & 2 \\ 1 & 0 & 2 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{pmatrix} \begin{matrix} -1 \\ 1 \\ \\ \end{matrix} \begin{pmatrix} 0 & 0 & -2 & 1 & -3 & 2 \\ 1 & 0 & 0 & 1 & -2 & 2 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{pmatrix} \begin{matrix} -\frac{1}{2} \\ \\ \\ \end{matrix}$$

$$\begin{pmatrix} 0 & 0 & 1 & -\frac{1}{2} & \frac{2}{3} & -1 \\ 1 & 0 & 0 & 1 & -2 & 2 \\ 0 & 1 & 0 & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 1 & -2 & 2 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 0 & 1 & -\frac{1}{2} & \frac{2}{3} & -1 \end{pmatrix} = A^{-1}$$

Review 5

$$A = \begin{pmatrix} q & -1 & q-2 \\ 1 & -p & 2-p \\ 2 & -1 & 0 \end{pmatrix}$$

$$+(-1(2-p)\cdot 2) = (-2+p)\cdot 2 = -4+2p$$

$$+((q-2)\cdot 1\cdot(-1)) = -q+2$$

$$-(2\cdot(-p)(q-2)) = -(-2p\cdot(q-2)) = +2pq-4p$$

$$-(-1(2-p)\cdot q) = -(-2+p)\cdot q = 2q - pq$$

$$|A| = -4+2p-q+2+2pq-4p+2q-pq$$

$$|A| = -2-2p+q+pq$$

$$\underline{\underline{|A| = (p+1)(q-2)}}$$

$$E = \begin{pmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{pmatrix}$$

$$A+E = \begin{pmatrix} q+1 & 0 & q-1 \\ 2 & 1-p & 3-p \\ 3 & 0 & 1 \end{pmatrix}$$

$$|A+E| = (q+1)\cdot(-p+1)\cdot 1 - 3\cdot(-p+1)\cdot(q-1)$$

$$|A+E| = -pq+q-p+1-(-3pq+3q+3p-3)$$

$$|A+E| = 2pq-2q-4p-2$$

$$|A+E| = 2(p-1)(q-2)$$

Så lenge $p \neq 1$ og $q \neq 2$, så har $|A+E|$ en invers

Ved regelen $|S|\cdot|A| = |SA|$

$|E| = 0$ Derfor $|DE| = |D|\cdot 0 = 0$, når determinanten $= 0$,

har matrisen ingen invers