Proves de matrius i complexos

Reference 4fq09iX2U / jli88slf . **Nom i llinatges:** .....

1. Opera els complexos

   a) $\dfrac{4-8\,i}{-4+8\,i}$

   b) $5+6\,i-1-\,i-(4+5\,i)$

   c) $\dfrac{1}{-5+3\,i}$

   d) $(-7-4\,i)\cdot(-8+7\,i)$

   e) $\dfrac{(-1+10\,i)\cdot(1+9\,i)}{-9\,i+-i}$

   f) $(-6+6\,i+6-8\,i)\cdot(4+4\,i-(10-7\,i))$

   g) $(10+5\,i)\cdot\left(-5-9\,i+\dfrac{-4\,i}{2-9\,i}\right)$

   h) $(-9+5\,i+7-5\,i)^2$

2. Calcula la inversa de les matrius (si existeix)

   a) $M=\begin{pmatrix}3&1\\2&2\end{pmatrix}$

   b) $M=\begin{pmatrix}-5&-4\\-2&3\end{pmatrix}$

   c) $M=\begin{pmatrix}0&2&3\\-4&3&-1\\4&1&5\end{pmatrix}$

   d) $M=\begin{pmatrix}5&-2&0\\-3&0&-1\\4&4&-1\end{pmatrix}$

3. Resol les equacions matricials

a) $A \cdot X = B$, essent $A = \begin{pmatrix} -2 & -3 \\ 3 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 3 & -5 \\ -4 & -2 \end{pmatrix}$

b) $A \cdot X = B$, essent $A = \begin{pmatrix} 4 & -2 & -3 \\ 0 & -4 & -1 \\ -4 & 3 & -5 \end{pmatrix}$, $B = \begin{pmatrix} -5 & -5 & -5 \\ -5 & -5 & -3 \\ -1 & 3 & -3 \end{pmatrix}$

c) $A \cdot X + C = B$, essent $A = \begin{pmatrix} -3 & -2 \\ 1 & 0 \end{pmatrix}$, $B = \begin{pmatrix} 1 & -4 \\ 4 & 0 \end{pmatrix}$, $C = \begin{pmatrix} 2 & -2 \\ 2 & 2 \end{pmatrix}$

d) $X \cdot A = X + B^2$, essent $A = \begin{pmatrix} 6 & 3 \\ -1 & -2 \end{pmatrix}$, $B = \begin{pmatrix} -2 & -1 \\ -2 & 5 \end{pmatrix}$

4. Calcula tots els possibles productes amb les matrius següents

a) $A = \begin{pmatrix} 3 & 3 & -4 \end{pmatrix}$, $B = \begin{pmatrix} -4 \\ 5 \end{pmatrix}$, $C = \begin{pmatrix} -1 & 2 \end{pmatrix}$

b) $A = \begin{pmatrix} 5 & -5 & -2 \end{pmatrix}$, $B = \begin{pmatrix} 5 & -1 & -3 \\ 1 & 3 & 4 \\ -3 & 5 & -5 \end{pmatrix}$, $C = \begin{pmatrix} -2 \\ 0 \\ 4 \end{pmatrix}$

5. a) $y = x^2 - 10\,x + 1$ b) $y = x^2 - 2\,x + 8$

Respostes

1. a) -1 b) 0

c) $-\frac{5}{34} - \frac{3}{34}\,i$ d) $84 - 17\,i$

e) $-\frac{1}{10} - \frac{91}{10}\,i$ f) $22 + 12\,i$

g) $-\frac{5}{17} - \frac{1935}{17}\,i$ h) 4

2. a) $\begin{pmatrix} \frac{1}{2} & -\frac{1}{4} \\ -\frac{1}{2} & \frac{3}{4} \end{pmatrix}$ b) $\begin{pmatrix} -\frac{3}{23} & -\frac{4}{23} \\ -\frac{2}{23} & \frac{5}{23} \end{pmatrix}$

c) $\begin{pmatrix} -1 & \frac{7}{16} & \frac{11}{16} \\ -1 & \frac{3}{4} & \frac{3}{4} \\ 1 & -\frac{1}{2} & -\frac{1}{2} \end{pmatrix}$ d) $\begin{pmatrix} \frac{2}{17} & -\frac{1}{17} & \frac{1}{17} \\ -\frac{7}{34} & -\frac{5}{34} & \frac{5}{34} \\ -\frac{6}{17} & -\frac{14}{17} & -\frac{3}{17} \end{pmatrix}$

3.

a) $\begin{pmatrix} -\frac{6}{5} & -\frac{16}{5} \\ -\frac{1}{5} & \frac{19}{5} \end{pmatrix}$

b) $\begin{pmatrix} -\frac{5}{66} & -\frac{25}{66} & -\frac{7}{33} \\ \frac{34}{33} & \frac{38}{33} & \frac{16}{33} \\ \frac{29}{33} & \frac{13}{33} & \frac{35}{33} \end{pmatrix}$

c) $\begin{pmatrix} 2 & -2 \\ -\frac{5}{2} & 4 \end{pmatrix}$

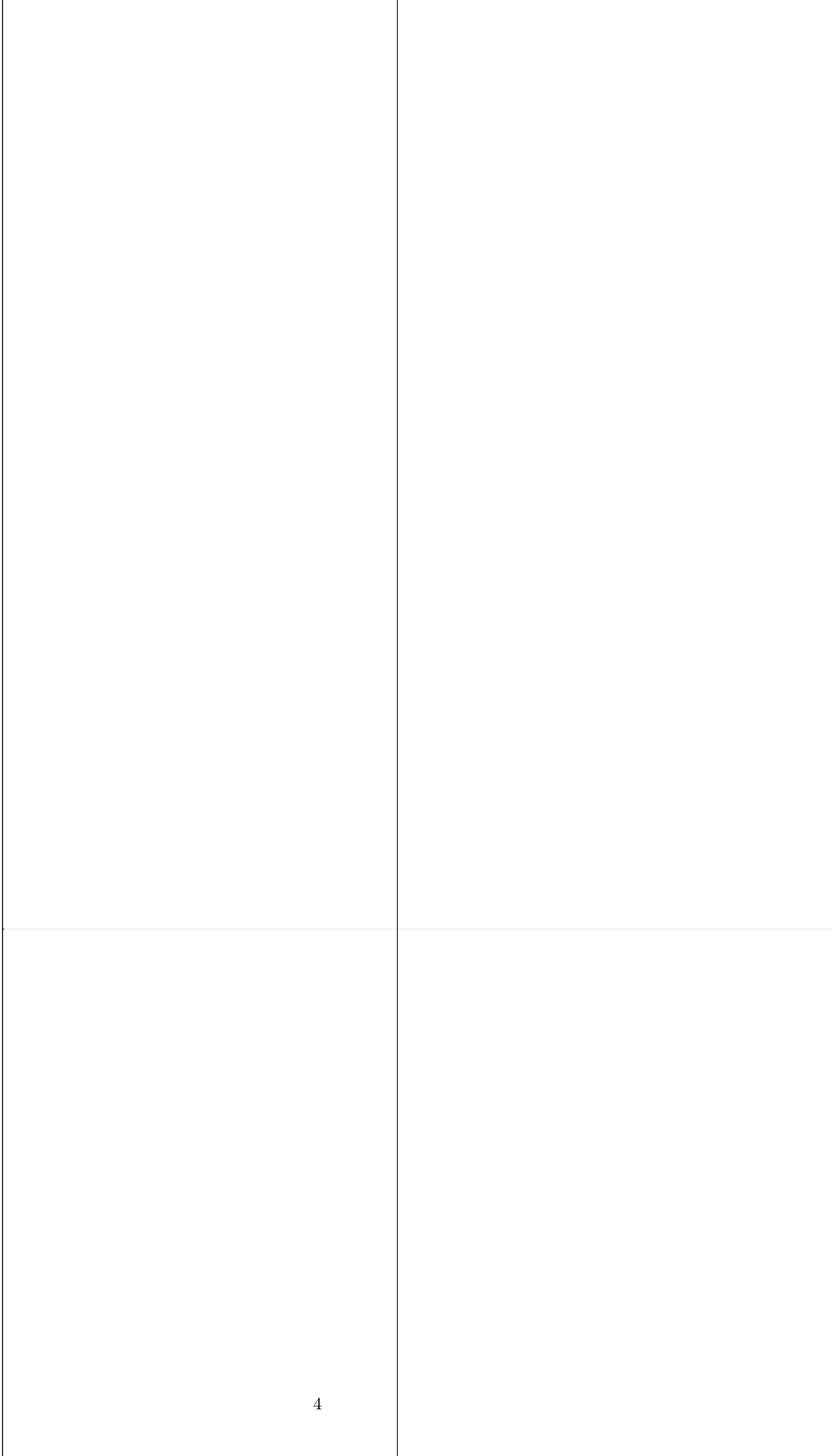
d) $\begin{pmatrix} -\frac{5}{12} & -\frac{1}{12} \\ -\frac{11}{12} & -\frac{31}{12} \end{pmatrix}$

4.

a) $B \cdot A = \begin{pmatrix} -12 & -12 & 16 \\ 15 & 15 & -20 \end{pmatrix}$, $B \cdot C = \begin{pmatrix} 4 & -8 \\ -5 & 10 \end{pmatrix}$, $C \cdot B = 14$,

b) $A \cdot B = \begin{pmatrix} 26 & -30 & -25 \end{pmatrix}$, $A \cdot C = -18$, $B \cdot B = \begin{pmatrix} 33 & -23 & -4 \\ -4 & 28 & -11 \\ 5 & -7 & 54 \end{pmatrix}$, $B \cdot C = \begin{pmatrix} -22 \\ 14 \\ -14 \end{pmatrix}$, $C \cdot A = \begin{pmatrix} -10 & 10 & 4 \\ 0 & 0 & 0 \\ 20 & -20 & -8 \end{pmatrix}$,

5.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