5. gyakorlat - Mátrix inverze, determinánsok

2022. március 15.

1. (a) $\underline{\underline{AC}} = \begin{pmatrix} 11 & 11 & 19 \\ 8 & 21 & 15 \end{pmatrix}$

   (b) $\underline{\underline{BC}} = \begin{pmatrix} 1 & 15 & 3 \\ 6 & 2 & 10 \end{pmatrix}$

   (c) $(\underline{\underline{A}} + \underline{\underline{B}})\underline{\underline{C}} = \begin{pmatrix} 12 & 26 & 22 \\ 14 & 23 & 25 \end{pmatrix}$

2. (a) $\underline{\underline{A}}^2 = \begin{pmatrix} \cos^2 x - \sin^2 & -2\sin x \cos x \\ 2\sin x \cos x & \cos^2 x - \sin^2 x \end{pmatrix}$

   (b) $\underline{\underline{A}}^{2009} \begin{pmatrix} \cos 2009x & -\sin 2009x \\ \sin 2009x & \cos 2009x \end{pmatrix}$

   (c) $\underline{\underline{A}}^{-1} = \begin{pmatrix} \cos x & \sin x \\ -\sin x & \cos x \end{pmatrix}$

   (d) $\underline{\underline{A}}^{-2009} \begin{pmatrix} \cos 2009x & \sin 2009x \\ -\sin 2009x & \cos 2009x \end{pmatrix}$

3. (a) $\underline{\underline{A}}^2 = \begin{pmatrix} 1 & 0 \\ 2 & 1 \end{pmatrix}$

   (b) $\underline{\underline{A}}^{2009} = \begin{pmatrix} 1 & 0 \\ 2009 & 1 \end{pmatrix}$

   (c) $\underline{\underline{A}}^{-1} = \begin{pmatrix} 1 & 0 \\ -1 & 1 \end{pmatrix}$

   (d) $\underline{\underline{A}}^{-2009} = \begin{pmatrix} 1 & 0 \\ -2009 & 1 \end{pmatrix}$

4. (a) $\underline{\underline{A}}^{-1} = \begin{pmatrix} -\frac{26}{17} & \frac{19}{34} & -\frac{6}{17} \\ -\frac{7}{17} & \frac{11}{34} & \frac{1}{17} \\ \frac{10}{17} & -\frac{3}{17} & \frac{1}{17} \end{pmatrix}$

   (b) Nincs inverz

5. (a) $x_1 = 41, x_2 = -17$

(b) $x_1 = -7,5b_1 + 0,5b_2 + 2,5b_3$,
$x_2 = 0,5b_1 + 0,5b_2 - 0,5b_3$,
$x_3 = 2,5b_1 - 0,5b_2 - 0,5b_3$

6. (a) -21
   (b) -5
   (c) -7
   (d) 18
   (e) 6
   (f) -2

7. (a) $k \neq 3, k \neq -1$
   (b) $k \neq -1$

8. (a) 0
   (b) $k^3 - 8k^2 - 10k + 95$

9. (a) $\underline{\underline{A}}^{-1} = \frac{1}{17}\begin{pmatrix} 3 & 8 & -5 \\ -15 & -6 & 8 \\ 16 & 3 & -4 \end{pmatrix}$
   (b) $\underline{\underline{A}}^{-1} = \begin{pmatrix} \frac{1}{3} & 0 & 0 \\ -3 & 1 & 0 \\ \frac{11}{6} & -\frac{1}{2} & \frac{1}{4} \end{pmatrix}$

10. (a) $x_1 = 3, x_2 = 5, x_3 = -1, x_4 = 8$
    (b) Nem oldható meg a Cramer-szabállyal, mert az együtthatómátrix determinánsa 0.