

5. Additional tasks for exercise on „Introduction to Numerical Mathematics“

Problem 19:

Domino Banking Group analyzes the business figures of the last 6 months:

$$[225, 230, 230, 200, 160, 110].$$

Compute

- (a) a linear and
- (b) a quadratic

function, which approximates the data in the least squares sense! In both cases, calculate the nearest zero.

Problem 20:

Using Gershgorin's circle theorem, calculate intervals for the eigenvalues of

$$A = \begin{pmatrix} -4 & 1 & 0 \\ 1 & -4 & 1 \\ 0 & 1 & -4 \end{pmatrix}, \quad B = 16 \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}, \quad C = \begin{pmatrix} 1 & 1.2 \\ 0.1 & -1 \end{pmatrix}.$$

So which of the matrices are safely invertible without further calculations? Estimate for these the eigenvalues of the inverses.