

ECON3120/4120 Mathematics 2, autumn 2008

Problems for Seminar 9, 3–7 November

1 Given the matrix

$$\mathbf{A}_t = \begin{pmatrix} 1 & t & 0 \\ -2 & -2 & -1 \\ 0 & 1 & t \end{pmatrix}$$

- (a) Calculate $|\mathbf{A}_t|$ and show that $(\mathbf{A}_t)^{-1}$ exists for all t .
- (b) Show that for a certain value of t we have $(\mathbf{A}_t)^3 = \mathbf{I}_3$, where \mathbf{I}_3 is the identity matrix of order 3.
- (c) Find the inverse of \mathbf{A}_1 .
- (d) Suppose that \mathbf{A} and \mathbf{B} are invertible $n \times n$ matrices. Show that if $\mathbf{A}'\mathbf{A} = \mathbf{I}_n$, then $(\mathbf{A}'\mathbf{B}\mathbf{A})^{-1} = \mathbf{A}'\mathbf{B}^{-1}\mathbf{A}$.

Exam problems: 95, 31, 41, 141.

A few extra exam problems: **57, 66, 104.** These problems will not be discussed in the seminar, but you will get solutions of them together with the solutions of the other problems.