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MATHEMATICS II solutions

(13.02.2011)

Chur formula

Original

1) regular for $x \neq 0$ and $x \neq -1$

$\lambda_1 = 2$, $\lambda_2 = \sqrt{t}$, $\lambda_3 = -\sqrt{t}$

$x = t(1,0,1)^T$, $t \in R$

2) $r(A) = r(A_b) = 2$ for $\lambda = -1$, $\mu = -1$ (2 degrees of freedom)

" " $= 3$ $\lambda \neq -1$, $\mu \in R$ (1 " " ")

$r(A) = 2$, $r(A_b) = 3$ for $\lambda = -1$, $\mu \neq -1$ (no solution)

$\lambda = 3$, $\mu = 7$, $x_4 = 2$, x_3 arbitrary, $x_2 = -3 - 2x_3$, $x_1 = 2x_3$

3) extreme points: $(0,0)$, $(4,0)$, $(17,13)$, $(10,20)$

4) local maximum $P(-1, 1, 2, \frac{23}{3})$

5. " $P(\frac{11}{3}, \frac{11}{3}, \frac{11}{3}, \frac{113}{9})$

6. $\xi(p) = \frac{c}{p^2+1}$ $\quad \xi_p(p) = \frac{8}{p^2+1}$