Norges teknisk–
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SIF5010 Matematikk 3 10.08.01

Fasit

Oppg 1 $z_0 = 0,\ z_{k+1} = e^{i(\frac{\pi}{4}+k\frac{2\pi}{4})}, \quad k = 0, 1, 2, 3$

Oppg 2
a) $y = \frac{1}{2}(e^{x^2-1} - 1)$
b) $y(\frac{3}{2}) \approx \frac{23}{32}$

Oppg 3
a) $y(x) = (x + \frac{3}{2}x^2)e^{2x}$
b) $y(x) = c_1 \sin(x) + c_2 \cos(x) + \ln(\sin(x)) \sin(x) - x\cos(x)$

Oppg 4 $x(t) = 2e^{-4t} - e^{-3t},\ y(t) = 3e^{-4t} - 2e^{-3t}$

Oppg 5
a) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 0 \end{bmatrix}$
b) $\text{Row(A)} = \text{span}\{(1,0,1),\ (0,1,1)\}$
$\text{Col(A)} = \text{span}\{(1,2,3),\ (1,0,-1)\}$
$\text{Null(A)} = \text{span}\{(-1,-1,1)\}$
c) $(1,2,3),\ (1,1,1)$ (f.eks)

Oppg 6 $A = \begin{bmatrix} 0 & 0 \\ 1 & 0 \end{bmatrix}, \quad B = \begin{bmatrix} 1 & 0 \\ 3 & 7 \end{bmatrix}, \quad C = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ (f.eks)

Oppg 7
a) $\lambda_1 = 10, \quad \mathbf{v_1} = \begin{bmatrix} 2 \\ 3 \end{bmatrix}$
$\lambda_2 = 5, \quad \mathbf{v_2} = \begin{bmatrix} 1 \\ -1 \end{bmatrix}$
b) 4000 gifte og 6000 ugifte menn