1) $\lambda(B_J) = \left\{\alpha;\ \frac{-\alpha-\sqrt{\alpha^2+8\alpha}}{2};\ \frac{-\alpha+\sqrt{\alpha^2+8\alpha}}{2}\right\}$ $\quad \alpha>0$

$|\alpha|<1;\ \to |-\alpha+\sqrt{\alpha^2+8\alpha}|<2$

$\alpha^2+8\alpha<(2+\alpha)^2 \quad 4\alpha<4 \quad \alpha<1$

$\Rightarrow 0<\alpha<\frac{1}{3}$

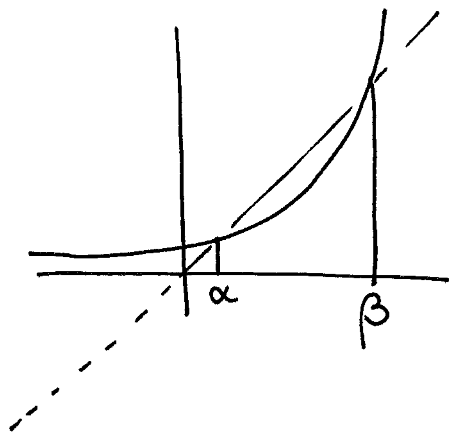
$\to |\alpha+\sqrt{\alpha^2+8\alpha}|<2$

$\cancel{\alpha^2}+8\alpha < 4-4\alpha+\cancel{\alpha^2} \quad \alpha<\frac{1}{3}$

$\lambda(B_{GS})=\{0;0;\alpha\} \quad \rho(B_{GS})=|\alpha|<1$

$$\begin{bmatrix} 1 & \frac14 & \frac14 \\ 1 & 1 & 1 \\ \frac14 & \frac14 & 1 \end{bmatrix} \Rightarrow L=\begin{bmatrix} 1 & 0 & 0 \\ 1 & 1 & 0 \\ \frac14 & \frac14 & 1 \end{bmatrix} \quad U=\begin{bmatrix} 1 & \frac14 & \frac14 \\ 0 & \frac34 & \frac34 \\ 0 & 0 & \frac34 \end{bmatrix}$$

2) •



$1<\alpha<2$

$8<\beta<9$

$g'(x)=\frac14 e^{x/4} >0 \quad e<1 \quad$ Cond. Suff. ↑ $x\in[0,2]$

$\frac14 e^{1/4} < g'(\alpha) < \frac14 e^{1/2}$ $\quad$ 1° ordine

$0.32 \qquad 0.41$

$\frac14 e^{2} < g'(\beta) < \frac14 e^{9/4}$

$>1 \qquad >1$

$x_0<\beta \quad x_n\to\alpha\ ; \quad x_0>\beta \quad x_n \nearrow +\infty$

• metodo di Newton $\quad f(x)=x\,e^{-\frac{x}{4}}-1$

$f(0)=-1 \quad f(2)=\frac{2}{\sqrt e}-1>0$

$f'(x)=e^{-\frac{x}{4}}\left(1-\frac{x}{4}\right)>0 \qquad x\in[0,2] \quad f'(0)=1;\ f'(2)=\frac{1}{2\sqrt e}$

$f''(x)=e^{-\frac{x}{4}}\left(\frac{x}{16}-\frac12\right)>0 \qquad$ "

$\left|\frac11\right|<2\ ; \quad \left|\frac{\frac{2-\sqrt e}{\sqrt e}}{1/2\sqrt e}\right| \approx 0.6 < 2$

$\Rightarrow$ Teorema
$\forall x_0\in[0,2]$
mdN converge a
$\alpha\in[0,2]$

3) Per esempio: Trapezi compositi

$$(b-a)\frac{H^2}{12}\max|f''(t)|$$

$$H=\frac{\pi}{M} \qquad b-a=\pi$$

$$f'(x)=\sin x+x\cos x$$

$$f''(x)=\cos x+\cos x-x\sin x=2\cos x-x\,\mathrm{sen}\,x$$

$$|f''(x)|\leq 2|\cos x|+|x||\mathrm{sen}\,x|\leq 2+\pi$$

$$\frac{\pi}{12}\cdot\left(\frac{\pi}{m}\right)^2\cdot(2+\pi)<\frac{1}{100}$$

$$\frac{1}{12}\cdot\pi^3(2+\pi)\cdot 100<m^2 \qquad m>36.449 \Rightarrow \bar{m}=37$$

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4) $S(1^-)=S(1^+)\wedge S'(1^-)=S'(1^+)\wedge S''(1^-)=S''(1^+)\wedge$ $S''(0)=S''(2)=0$. Si ottiene:

$a=2$; $b=-1$; $c=-3$; $d=1$

(dove: $S'(x)=\begin{cases}2-3x^2 & \dots\\ b+2c(x-1)+3d(x-1)^2 & \dots\end{cases}$

$S''(x)=\begin{cases}-6x & \dots\\ 2c+6d(x-1) & \dots\end{cases}$

5) Vedi dispensa E.Z.