(4.) $A = \begin{pmatrix} 1 & 10 \\ \delta & 1 \end{pmatrix}$

$\Downarrow$

1. $(1-\lambda)^2 - 10\delta = 0$

$1-\lambda = \pm\sqrt{10\delta}$

$\lambda_1 = 1+\sqrt{10\delta}$
$\lambda_2 = 1-\sqrt{10\delta}$ $\Rightarrow$ $\epsilon(\delta) = 1+\sqrt{10\delta}$

2. $d\epsilon(\delta) = \sqrt{10}\,\frac{d\delta}{2\sqrt{\delta}}$

$\Downarrow$

$K(\delta) = \frac{d\epsilon(\delta)}{d\delta} = \frac{\sqrt{10}}{2\sqrt{\delta}}$ //

$\Downarrow$

3. $K(10) = \frac{1}{2}$; $K(0,1) = 5$. //

(1.) 1. $\mathcal{L}_n(\alpha) = \int_0^1 \frac{x^n}{x+\alpha}\,dx = \int_0^1 \frac{x^n + \alpha x^{n-1} - \alpha x^{n-1}}{x+\alpha}\,dx =$

$= \int_0^1 x^{n-1}\,dx - \int_0^1 \frac{\alpha x^{n-1}}{x+\alpha}\,dx = \frac{1}{n} - \alpha\,\mathcal{L}_{n-1}$

$\Downarrow$

$\mathcal{L}_n = \frac{1}{n} - \alpha\,\mathcal{L}_{n-1}$ //

2. $\mathcal{L}_0(\alpha) = \int_0^1 \frac{1}{x+\alpha}\,dx = \ln\left|\frac{x+\alpha}{\alpha}\right|$ //

3. —