

2.

$$\int_a^b \tilde{f} \times \int_a^b \frac{1}{\tilde{f}} \quad \begin{cases} f := \sqrt{\tilde{f}} \\ g := \frac{1}{\sqrt{\tilde{f}}} \end{cases}$$

$$\int_a^b f^2 \int_a^b g^2 \geq \left(\int_a^b 1 \right)^2 = (b-a)^2$$

Ainsi, $(b-a)^2$ minore $\left\{ \int_a^b f \int_a^b \frac{1}{f}, f \in E \right\}$

On prend $f = 1$

$$\int_a^b f \int_a^b \frac{1}{f} = \int_a^b 1 \int_a^b 1$$

$$= (b-a)(b-a)$$

$$= (b-a)^2$$

$$= \min \left\{ \int_a^b f \int_a^b \frac{1}{f}, f \in E \right\}$$