Schwarz Inequality

if $f^2(x)$ & $g^2(x)$ are Integrable on $[a,b]$
then

$$\left| \int_a^b f(x)\,g(x)\,dx \right| \leq \sqrt{\left(\int_a^b f^2(x)\,dx\right)\left(\int_a^b g^2(x)\,dx\right)}$$

Proof.

$$F(x) = \int_a^b \left(f(x) - \lambda(g(x))\right)^2 \geq \int_a^b 0 : \lambda \in R$$

$$\lambda^2 \int_a^b g^2(x)\,dx - 2\lambda \int_a^b f(x)\,g(x)\,dx$$

$$+ \int_a^b f^2(x)\,dx \geq 0 \quad \forall \lambda \in R$$

then $D \leq 0$

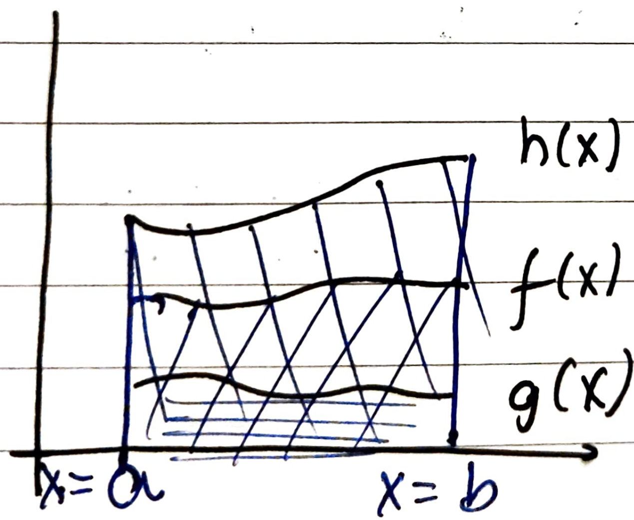
H. Proved

Date:

Inequality (estimation)

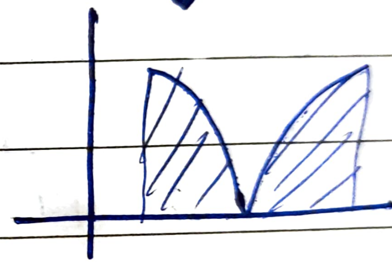
1) if $g(x) \leqslant f(x) \leqslant h(x)$ then

$$\int_a^b g(x)\,dx \leqslant \int_a^b f(x)\,dx \leqslant \int_a^b h(x)\,dx$$



3 $\left|\int_a^b f(x)\,dx\right| \leq \int_a^b |f(x)|\,dx$ $f($

~~th~~ as the the individual sum ka mod $<$



like $|5-3| < |5|+|-3|$

$\star$ $\int_0^{\frac{\pi}{2}} \ln(\sin x)\,dx = \int_0^{\frac{\pi}{2}} \ln(\cos x)\,dx = -\frac{\pi}{2}\ln 2$

$\star$ $\int_0^{\frac{\pi}{2}} \ln(\sec x)\,dx = \frac{\pi}{2}\ln 2$ $\quad\star$ $\int_0^{\frac{\pi}{2}} \ln(\tan x)\,dx = 0$