① Suppose L is a local operator.
Prove that L^* is a local operator.

pf). If s vanishes on U, $L^*s = 0$ on U ?

To show this, for $x \in U$, we need to show that $L^*s(x) = 0$.
First, $\exists$ an open set $V \ni x$ s.t $\bar{V} \subset U$.

$\Rightarrow$? $\langle L^*s, \sigma \rangle = 0$ for all σ s.t $\sigma = 0$ on $\bar{V}^c$.

$\langle L^*s, \sigma \rangle = \langle s, L\sigma \rangle = 0$

$\langle L^*s, \sigma \rangle = \int L^*s \wedge *\sigma$ is assumed.

② E. F vector bundles over M.
Then $\Gamma(E) \otimes \Gamma(F)$ is dense in $\Gamma(E \otimes F)$.

pf) To show this, we need to show that given $\psi \in \Gamma(E \otimes F)$, if $\int_M \langle \psi, s \otimes \sigma \rangle \, dx = 0$

for all $s \in \Gamma(E)$ & all $\sigma \in \Gamma(F)$, $\psi = 0$.

Suppose $\psi \neq 0$. $\Rightarrow \exists$ $x_0 \in M$. s.t $\psi(x_0) \neq 0$.

Let $\{e_\alpha\}$ be a local frame. for $U \ni x_0$.
" $\{\sigma_\alpha\}$ " for " .
For simplicity, $\dim E = \dim F = 2$.

$$\Rightarrow \quad \psi = a_{11}(x)\, e_1 \otimes \sigma_1 + a_{12}(x)\, e_1 \otimes \sigma_2 + a_{21}(x)\, e_2 \otimes \sigma_1 + a_{22}(x)\, e_2 \otimes \sigma_2 .$$