

$$(b) \int_M \langle \text{grad } f; X \rangle_i g dV_g = \int_M f \langle X; N \rangle_i dV_g = \int_M f \text{div } X dV_g$$

$$(c) \int_M \langle \text{grad } u; \text{grad } v \rangle_i g dV_g = \int_M \langle \text{grad } u; \text{grad } v \rangle_i g dV_g$$