

Let  $T(\boldsymbol{\epsilon}, \psi) = \mathcal{Id}(\boldsymbol{\epsilon})$  be the identity map. Then the expectation equates to:

$$\begin{aligned}
\nabla_{\psi} \mathbb{E}_{q_{\psi}(\mathbf{z})}[f(\mathbf{z})] &= \nabla_{\psi} \mathbb{E}_{p_{\psi}(\mathbf{z})}[f(T(\boldsymbol{\epsilon}, \psi))] \\
&= \int_{\Omega} p_{\psi}(\boldsymbol{\epsilon}) \nabla_{\psi} f(T(\boldsymbol{\epsilon}, \psi)) d^n \boldsymbol{\epsilon} + \int_{\Omega} p_{\psi}(\boldsymbol{\epsilon}) f(T(\boldsymbol{\epsilon}, \psi)) \nabla_{\psi} \log(p_{\psi}(\boldsymbol{\epsilon})) d^n \boldsymbol{\epsilon} \\
&= \int_{\Omega} q_{\psi}(\mathbf{z}) \nabla_{\psi} f(\mathbf{z}) d^n \mathbf{z} + \int_{\Omega} q_{\psi}(\mathbf{z}) f(\mathbf{z}) \nabla_{\psi} \log(q_{\psi}(\mathbf{z})) d^n \mathbf{z} \\
&= 0 + \mathbb{E}_{q_{\psi}(\mathbf{z})}[f(\mathbf{z}) \nabla_{\psi} \log(q_{\psi}(\mathbf{z}))]
\end{aligned}$$