

$$\mathbb{E}[z] = \mathbb{E}[Q(\mathbf{x})] = \int Q(\mathbf{x}) \pi(\mathbf{x}) d\mathbf{x} = \frac{1}{Z} \int Q(\mathbf{x}) \frac{\gamma(\mathbf{x})}{q(\mathbf{x})} q(\mathbf{x}) d\mathbf{x}$$