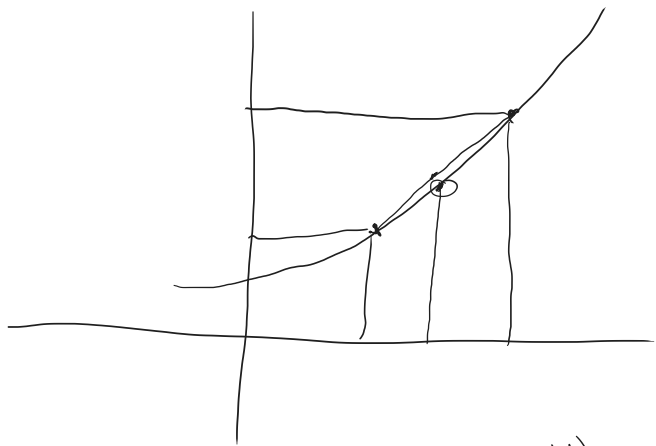


JENSEN'S INEQUALITY:

$$\psi(E(X)) \leq E(\psi(X)) \quad \text{IF } \psi \text{ IS CONVEX.}$$

$$\begin{aligned} & \psi(tx + (1-t)y) \\ & \leq t\psi(x) + (1-t)\psi(y) \end{aligned}$$



$$KL[p||q] = - \int p(x) \log\left(\frac{q(x)}{p(x)}\right) dx$$

$$= \int p(x) \left[-\log\left(\frac{q(x)}{p(x)}\right) \right] dx = E_p \left[-\log\left(\frac{q(x)}{p(x)}\right) \right]$$

$$\geq -\log\left(E_p\left(\frac{q(x)}{p(x)}\right)\right) = -\log \int \frac{q(x)}{p(x)} p(x) dx = -\log \int q(x) dx = -\log 1 = 0$$