

$$\begin{aligned}
 a) \quad d(y; w) &= \exp \left\{ y \ln(w) - (y+1) \ln(w+1) \right\} \\
 &= \exp \left\{ y \ln(w) - y \ln(w+1) - \ln(w+1) \right\} \\
 &= \exp \left\{ y \ln \left[\frac{w}{w+1} \right] - \ln(w+1) \right\}
 \end{aligned}$$

$$\theta = \ln \left[\frac{w}{w+1} \right] \quad \eta(\theta) = \ln(w+1) \quad \phi = 1$$

$$C(y; \phi) = 0$$

$$e^\theta = \frac{w}{w+1} \Rightarrow e^\theta w + e^\theta = w \quad ; \quad e^\theta = w - e^\theta w \quad ; \quad e^\theta = w(1 - e^\theta)$$

$$w = \frac{e^\theta}{1 - e^\theta}$$

$$\eta(\theta)' = \ln \left(\frac{e^\theta}{1 - e^\theta} + 1 \right) = \ln \left(\frac{e^\theta + 1 - e^\theta}{1 - e^\theta} \right) = \ln \left(\frac{1}{1 - e^\theta} \right)$$