Answer: Assuming that we have a perfect prediction function $h(x^{(i)} = p(y^{(i)} = 1|x^{(i)})$, (logistic regression on our partial labels $y^{(i)}$ is not perfect but is aiming towards this), If we crucially assume that $p(t^{(i)} = 1|x^{(i)}) \in \{0, 1\}$, i.e. given observed data, there is no uncertainty in the true label $t^{(i)}$. Then

$$\begin{aligned} E[h(x^{(i)}))|y^{(i)} = 1] &= E[p(y = 1|x)\ |y = 1] = E[p(y = 1|x)\ |y = 1, t = 1] \quad \text{,since } y = 1 \implies t = 1 \\ &= E[p(t = 1|x)\alpha\ |y = 1, t = 1] \end{aligned}$$