Q1

b) $p(y|x) = \dfrac{p(x|y) \cdot p(y)}{p(x)}$

e) $\hat{y} = \underset{y}{argmax}\ p(y|x) = \underset{y}{argmax}\ \dfrac{p(x|y)\ p(y)}{p(x)}$

For continuous variable x, this is $\underset{y}{argmax}\ \dfrac{f(x|y)\ f(y)}{f(x)}$

since $f(x)$ does not change the value of $\underset{y}{argmax}$

$\hat{y} = \underset{y}{argmax}\ f(x|y)\ f(y)$ holds □

since we are taking the max argument, applying log still
yield the same argument

∴ $\hat{y} = \underset{y}{argmax}\ log\ (f(x|y)\ p(y))$ holds ▨

f