HW 3

Wednesday, October 27, 2021 7:03 PM

Problem 1:

$$E_{(x,y)}[l(f(x),y)] = \int_x \left\{ \int_y (z-y)^2 p(y|x) dy \right\} p(x) dx = 0$$

$$\frac{\partial}{\partial x}\left[\int_x \left\{ \int_y (z-y)^2 p(y|x) dy \right\} p(x) dx = 0 \right]$$

$$\int_x \left\{ \int_y \frac{\partial}{\partial x} (z-y)^2 p(y|x) dy \right\} p(x) dx = 0$$

$$\int_x \left\{ \int_y 2(z-y) p(y|x) dy \right\} p(x) dx = 0$$

$$2z = 2y\big(p(y|x)\big)$$

$$f(x) = E[y|x]$$