$$loss(x) = \left(h_1(x) - h_2(x)\right)^2$$

$$h_1(x) = 2g_1(x) + 1 \rightarrow 7$$

$$h_2(x) = 2g_1(x) + g_2(x) \rightarrow 8$$

$$g_1(x) = 3x \rightarrow 3$$

$$g_2(x) = x^2 + x \rightarrow 2$$

$$\frac{\partial l}{\partial x} = \frac{\partial l}{\partial h_1} \cdot \frac{\partial h_1}{x} + \frac{\partial l}{\partial h_2} \cdot \frac{\partial h_2}{\partial x}$$

$$= 2\left(h_1 - h_2\right) \cdot \frac{\partial h_1}{\partial x} + 2\left(h_2 - h_1\right) \frac{\partial h_2}{\partial x}$$

$$= 2\left(h_1 - h_2\right)\left(\frac{\partial h_1}{\partial x} - \frac{\partial h_2}{\partial x}\right)$$

$$= 2\left(h_1 - h_2\right)\left(\frac{\partial h_1}{\partial g_1} \cdot \frac{\partial g_1}{\partial x} - \frac{\partial h_2}{\partial g_1}\frac{\partial g_1}{\partial x} - \frac{\partial h_2}{\partial g_2} \cdot \frac{\partial g_2}{\partial x}\right)$$

$$= 2\left(h_1 - h_2\right)\left(2 \cdot 3 - 2 \cdot 3 - 1 \cdot (2x+1)\right) = 2\left(h_1 - h_2\right)(-2x-1)$$

$$= 2\left(h_2 - h_1\right)(2x+1)$$

$$x = 1 \Rightarrow \frac{\partial l}{\partial x} = 2(8-7)(3) = 6$$