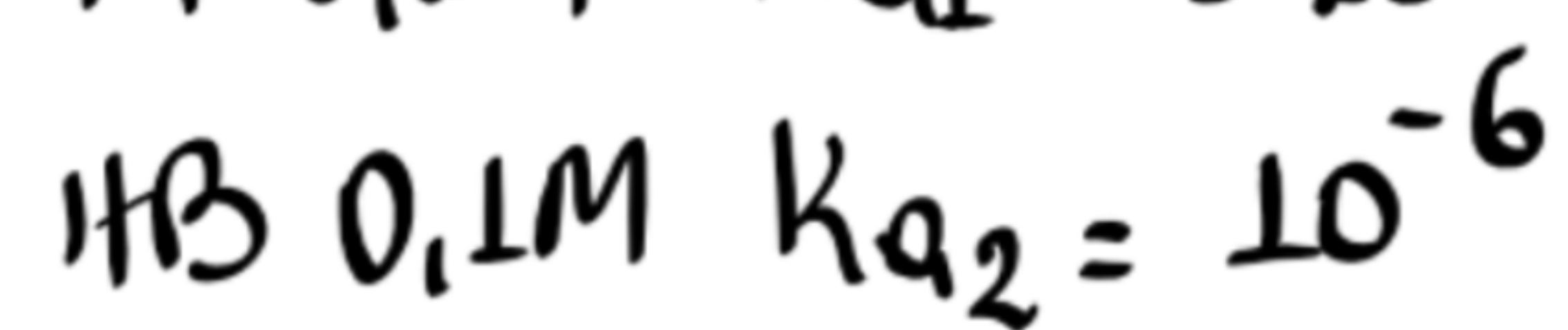
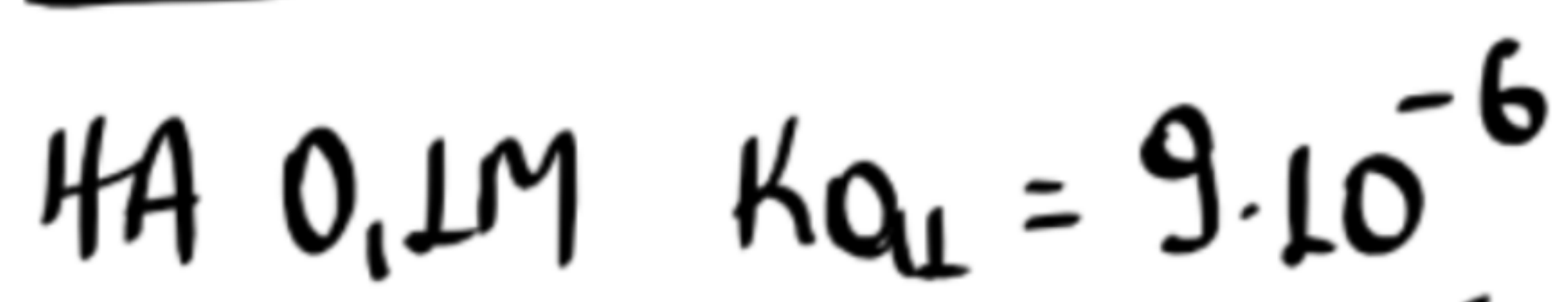
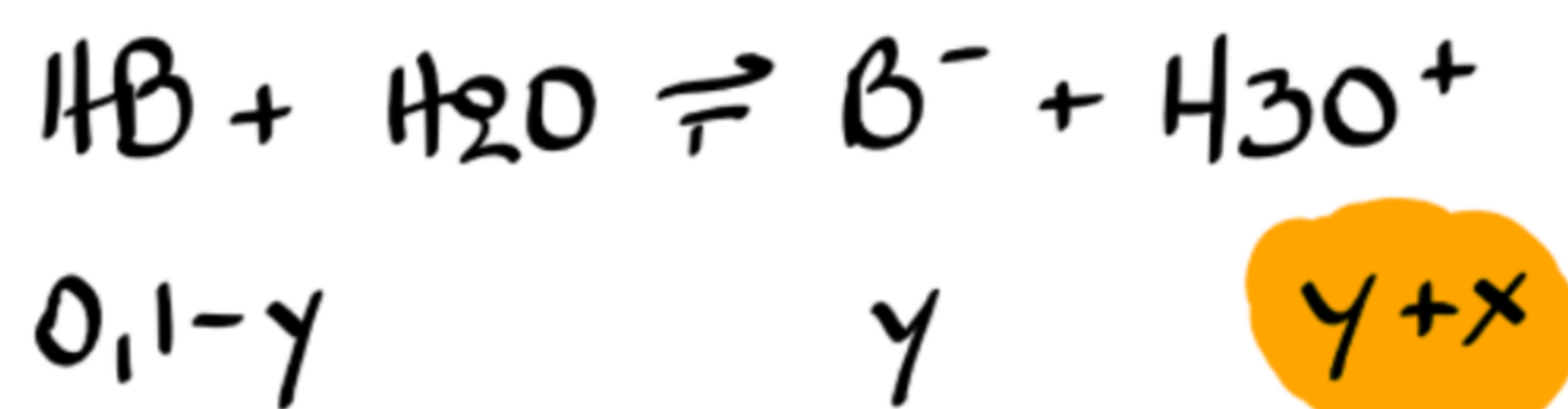
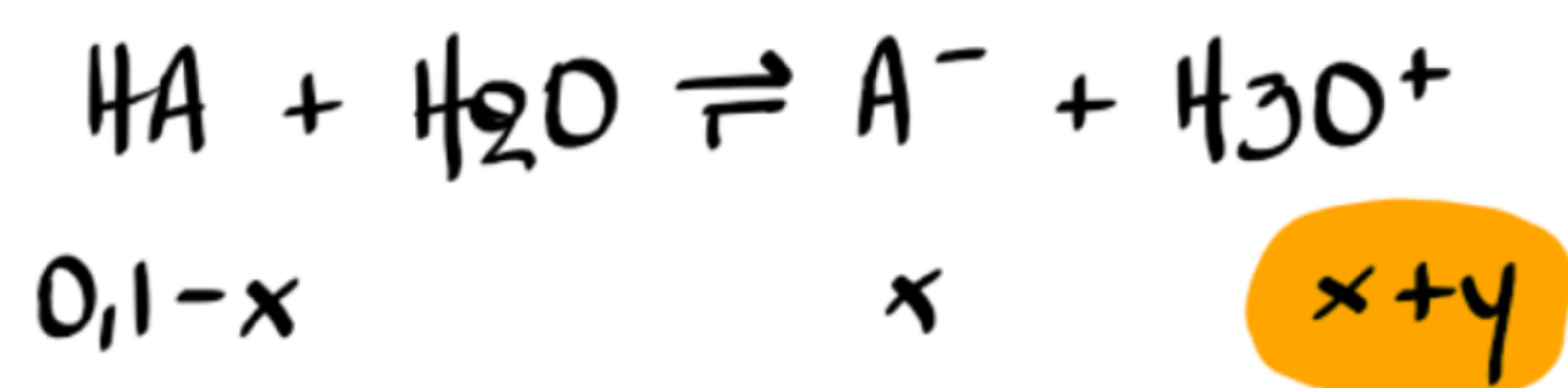


Άσκηση 9.18.

Δ1



pH = ?



$$K_{a\text{HA}} = \frac{x \cdot (x+y)}{0,1-x} \xrightarrow{\frac{K_a}{0,1} \ll 10^{-2}} \frac{x \cdot (x+y)}{0,1-x} \approx 0,1$$

$$K_{a\text{HB}} = \frac{y \cdot (y+x)}{0,1-y} \approx \frac{y \cdot (y+x)}{0,1}$$

$$\Rightarrow K_{a\text{HA}} = \frac{x \cdot (x+y)}{0,1} \Rightarrow 9 \cdot 10^{-6} = \frac{x \cdot (x+y)}{0,1}$$

$$\Rightarrow 10^{-6} = \frac{y \cdot (y+x)}{0,1}$$

$$\Rightarrow x \cdot (x+y) = 0,9 \cdot 10^{-6} \quad (1)$$

$$\Rightarrow y \cdot (y+x) = 0,1 \cdot 10^{-6} \quad (2)$$

$$(1):(2) \Rightarrow \frac{x \cdot (x+y)}{y \cdot (y+x)} = \frac{0,9 \cdot 10^{-6}}{0,1 \cdot 10^{-6}} \Rightarrow \frac{x}{y} = \frac{9}{1} \Rightarrow x = 9 \cdot y$$

Άρα:  $[\text{H}_3\text{O}^+]_{\text{ολ}} = x + y = 9y + y = 10y = ?$

$$\text{στην (2): } 9y(9y + y) = 0,1 \cdot 10^{-6} \Rightarrow 9y \cdot 10y = 0,1 \cdot 10^{-6} \Rightarrow 90y^2 = 0,1 \cdot 10^{-6} \Rightarrow$$

$$\Rightarrow y^2 = \frac{1 \cdot 10^{-7}}{9 \cdot 10^1} = 10^{-8}$$

$$\Rightarrow y = 10^{-4}$$

$$\text{και } x = 9 \cdot 10^{-4}$$

οπότε:  $[\text{H}_3\text{O}^+]_{\text{ολ}} = 10y = 10 \cdot 10^{-4} = 10^{-3} \text{M}$  άρα pH = 3

$$\alpha_{\text{HA}} = \frac{x}{0,1} = \frac{9 \cdot 10^{-4}}{10^{-1}} = 9 \cdot 10^{-3}$$

$$\alpha_{\text{HB}} = \frac{y}{0,1} = \frac{10^{-4}}{10^{-1}} = 10^{-3}$$