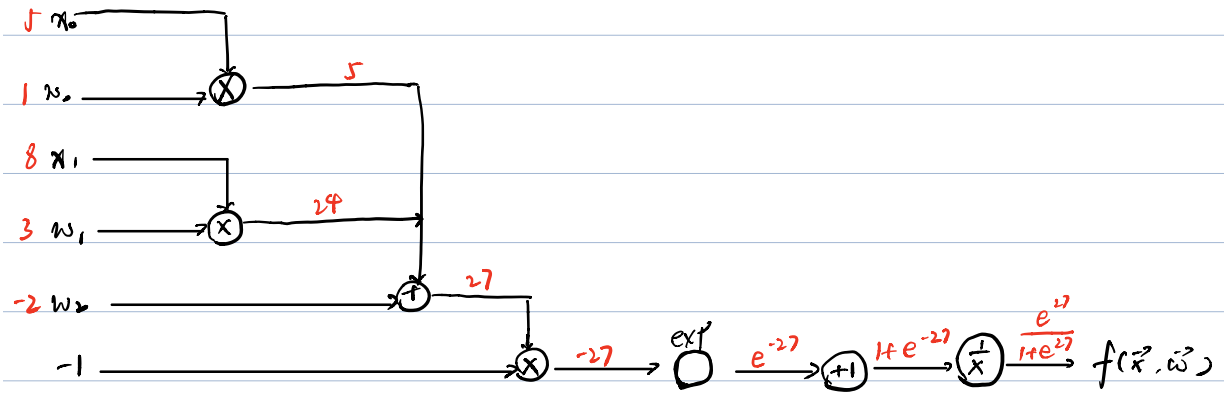
(a) Solution:



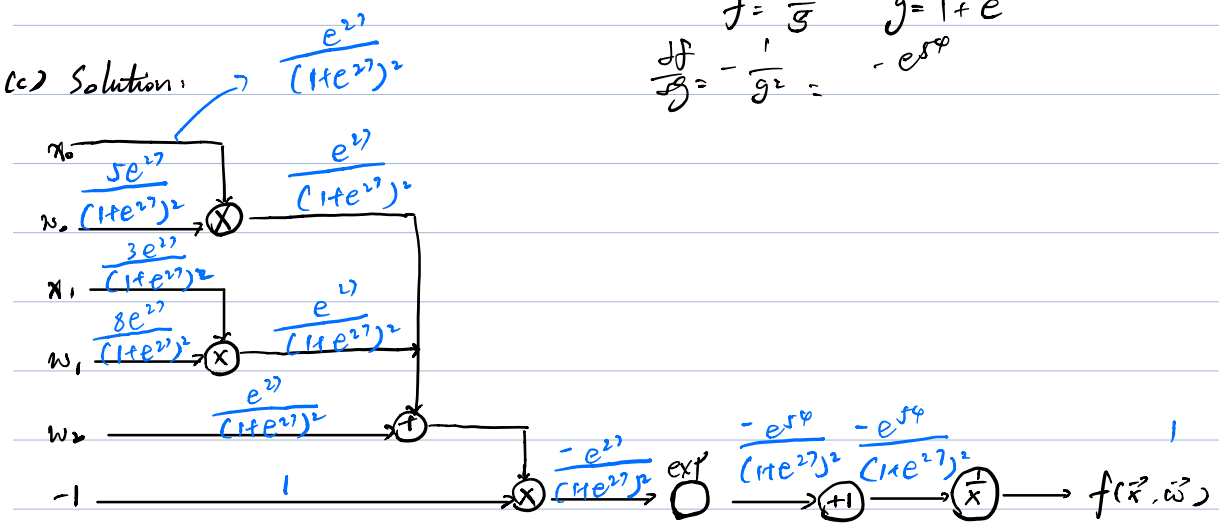
(b) Solution:

The solution of this problem is shown with red letters in (a).

(c) Solution:

$f = \frac{1}{g}$ $\quad g = 1 + e^{-27}$

$\frac{df}{dg} = -\frac{1}{g^2} = -e^{54}$



(d) Proof. $\frac{d\sigma(x)}{dx} = -\frac{-e^{-x}}{(1+e^{-x})^2} = \frac{e^{-x}}{(1+e^{-x})^2}$

$(1-\sigma(x))\sigma(x) = \frac{1}{1+e^{-x}} \cdot \frac{e^{-x}}{1+e^{-x}} = \frac{e^{-x}}{(1+e^{-x})^2} = \frac{d\sigma(x)}{dx}$ RED

(e) Solution: $\frac{e^{-27}}{(1+e^{-27})^2}$