Computational graph:

$w_1 \rightarrow v_1 = \log w_1 \rightarrow v_2 = w_2 v_1 \rightarrow v_3 = \sqrt{v_2} \rightarrow L = v_2 + v_3$

$v_2, \dfrac{\partial v_2}{\partial w_2} \longrightarrow v_3 = \sqrt{v_2} \longrightarrow v_3, \dfrac{\partial v_3}{\partial w_2}$