$$\nabla_\theta L \qquad \nabla\ell \qquad Dg_k \qquad Dg_{k-1} \qquad Dg_2 \qquad Dg_1$$

$$1 \times p \;=\; 1 \times d_k \quad d_k \times d_{k-1} \quad d_{k-1} \times d_{k-2} \;\cdots\; d_2 \times d_1 \quad d_1 \times p$$

$$1 \times p \;=\; 1 \times d_k \quad d_k \times d_{k-1} \quad d_{k-1} \times p \qquad \mathcal{O}(kp) \quad \blacksquare\,\text{Forward}$$

$$1 \times p \;=\; \text{Reverse}\,\blacksquare \qquad \mathcal{O}(k+p) \quad 1 \times d_2 \quad d_2 \times d_1 \quad d_1 \times p$$