Правила преобразования

$$dA = 0$$

$$d(\alpha X) = \alpha(dX)$$

$$d(AXB) = A(dX)B$$

$$d(X + Y) = dX + dY$$

$$d(X^T) = (dX)^T$$

$$d(XY) = (dX)Y + X(dY)$$

$$d\langle X, Y \rangle = \langle dX, Y \rangle + \langle X, dY \rangle$$

$$d\left(\frac{X}{\phi}\right) = \frac{\phi dX - (d\phi)X}{\phi^2}$$

Таблица стандартных производных

$$d\langle A, X \rangle = \langle A, dX \rangle$$

$$d\langle Ax, x \rangle = \langle (A + A^T)x, dx \rangle$$

$$d\langle Ax, x \rangle = 2\langle Ax, dx \rangle \qquad (\textbf{если } A = A^T)$$

$$d(\text{Det}(X)) = \text{Det}(X)\langle X^{-T}, dX \rangle$$

$$d(X^{-1}) = -X^{-1}(dX)X^{-1}$$