Derivatives

constant . . . . . $\partial/\partial x\,(c) = 0$ where c is a constant

sum . . . .$\partial/\partial x\,(\mathbf{u} + \mathbf{v}) = \partial \mathbf{u}/\partial x + \partial \mathbf{v}/\partial x$
difference . . . . .$\partial/\partial x\,(\mathbf{u} - \mathbf{v}) = \partial \mathbf{u}/\partial x - \partial \mathbf{v}/\partial x$

product . . . . . $\partial/\partial x\,(\mathbf{u} \times \mathbf{v}) = \mathbf{u}\,\partial \mathbf{v}/\partial x + \mathbf{v}\,\partial \mathbf{u}/\partial x$
quotient . . . . . $\partial/\partial x\,(\mathbf{u} / \mathbf{v}) = (\mathbf{v}\,\partial \mathbf{u}/\partial x - \mathbf{u}\,\partial \mathbf{v}/\partial x) / \mathbf{v}^2$
reciprocal . . . . $\partial/\partial x\,(1 / \mathbf{g}(x)) = -\,\partial/\partial x\,(\mathbf{g}(x)) / (\mathbf{g}(x))^2$

power rule . . . . $\partial/\partial x\,(u^n) = n\,u^{n-1}\,\partial \mathbf{u}/\partial x$ also $\partial/\partial x\,(\mathbf{g}(x))^n = n\,[\mathbf{g}(x)]^{n-1}\,\partial/\partial x\,\mathbf{g}(x)$
exponential . . . $\partial/\partial x\; e^u = e^u\,\partial \mathbf{u}/\partial x$ particular case of the power rule
chain rule . . . . $\partial y/\partial x = \partial y/\partial u \times \partial \mathbf{u}/\partial x = f'(u)\,g'(\mathbf{u}) = f'(\mathbf{g}(x))\,\mathbf{g}'(x)$
composition . . . $\partial/\partial x\,(\mathbf{f}(\mathbf{g}(x)) = f'(\mathbf{g}(x))\,\mathbf{g}'(x)$

$\partial/\partial x\,(a^u) = a^u \ln a\,\partial \mathbf{u}/\partial x$

composition . . . $\partial/\partial x\,(\mathbf{f}(\mathbf{g}(x)) = f'(\mathbf{g}(x))\,\mathbf{g}'(x)$

$\partial/\partial x\,(a^u) = a^u \ln a\,\partial \mathbf{u}/\partial x$
$\partial/\partial x\,(\ln |u|) = 1/u\,\partial \mathbf{u}/\partial x$
$\partial/\partial x\,(\log_a |u|) = 1/(u \ln a)\,\partial \mathbf{u}/\partial x$

Derivatives of trigonometric functions:

$\partial/\partial x\,\sin \mathbf{u} = \cos \mathbf{u}$
$\partial/\partial x\,\cos \mathbf{u} = -\sin \mathbf{u} \times \partial \mathbf{u}/\partial x$
$\partial/\partial x\,\tan \mathbf{u} = \sec \mathbf{u}^2\,\partial \mathbf{u}/\partial x$
$\partial/\partial x\,\cot \mathbf{u} = -\csc \mathbf{u} \times \partial \mathbf{u}/\partial x$
$\partial/\partial x\,\sec \mathbf{u} = \sec \mathbf{u} \tan \mathbf{u}\,\partial \mathbf{u}/\partial x$
$\partial/\partial x\,\csc \mathbf{u} = -\csc \mathbf{u} \cot \mathbf{u}\,\partial \mathbf{u}/\partial x$