Таблица производных

Простые		Сложные	
$y = x^n$	$y' = nx^{n-1}$	$y = U^{\alpha}$	$y' = \alpha U^{\alpha-1} U'$
$y = \frac{1}{x}$	$y' = -\frac{1}{x^2}$	$y = \frac{1}{U}$	$y' = -\frac{U'}{U^2}$
$y = \sqrt{x}$	$y' = \frac{1}{2\sqrt{x}}$	$y = \sqrt{U}$	$y' = \frac{U'}{2\sqrt{U}}$
$y = \sin x$	$y' = \cos x$	$y = \sin U$	$y' = (\cos U) \cdot U'$
$y = \cos x$	$y' = -\sin x$	$y = \cos U$	$y' = (-\sin x) \cdot U'$
$y = tgx$	$y' = -\frac{1}{\cos^2 x}$	$y = tgU$	$y' = -\frac{U'}{\cos^2 U}$
$y = ctgx$	$y' = -\frac{1}{\sin^2 x}$	$y = ctgU$	$y' = -\frac{U'}{\sin^2 U}$
$y = a^x$	$y' = a^x \ln a$	$y = a^U$	$y' = U^x \ln U \cdot U'$
$y = e^x$	$y' = e^x$	$y = e^U$	$y' = e^U \cdot U'$
$y = \log_a x$	$y' = \frac{1}{x \ln a}$	$y = \log_a U$	$y' = \frac{U'}{U \ln a}$
$y = \ln x$	$y' = \frac{1}{x}$	$y = \ln U$	$y' = \frac{U'}{U}$
$y = \arccos x$	$y' = -\frac{1}{\sqrt{1-x^2}}$	$y = \arccos U$	$y' = -\frac{U'}{\sqrt{1-U^2}}$
$y = \arcsin x$	$y' = \frac{1}{\sqrt{1-x^2}}$	$y = \arcsin U$	$y' = \frac{U'}{\sqrt{1-U^2}}$
$y = arctgx$	$y' = \frac{1}{1+x^2}$	$y = arctgU$	$y' = \frac{U'}{1+U^2}$
$y = shx$	$y' = chx$	$y = shU$	$y' = chU \cdot U'$
$y = chx$	$y' = shx$	$y = chU$	$y' = shU \cdot U'$
$y = thx$	$y' = \frac{1}{ch^2 x}$	$y = thU$	$y' = \frac{U'}{ch^2 U}$
$y = cthx$	$y' = -\frac{1}{sh^2 x}$	$y = cthU$	$y' = -\frac{U'}{sh^2 U}$

Правила дифференцирования

Если C - некоторое число, $U = U(x)$ $V = V(x)$ - некоторые дифференцируемые функции, то справедливы следующие правила дифференцирования:

1. $C' = 0;$
2. $x' = 1;$
3. $(U \pm V)' = U' \pm V';$
4. $(CU)' = CU';$
5. $(UV)' = U'V + UV';$
6. $\left(\frac{U}{V}\right)' = \frac{U'V - UV'}{V^2}\ (V \neq 0);$
7. $\left(\frac{C}{V}\right)' = -\frac{CV'}{V^2}\ (V \neq 0).$
8. $(UVW)' = U'VW + UV'W + UVW'$
9. $U = f(y) \to y = \varphi(x) \Rightarrow U_x = f'_y y'_x$