Derivatives of Complicated Functions

Rule	y	dy/dx
Power Rule	$y = x^n$	$\frac{dy}{dx} = nx^{n-1}$
Chain Rule	$y = f(u)$	$\frac{dy}{dx} = \frac{dy}{du}\ \frac{du}{dx} = f'(u)u'$
Product Rule	$y = uv$	$\frac{dy}{dx} = uv' + vu'$
Quotient Rule	$y = \frac{u}{v}$	$\frac{dy}{dx} = \frac{vu' - uv'}{v^2}$

$n =$ *any rational number*

$u = u(x)$ $\quad u' = \frac{du}{dx}$

$v = v(x)$ $\quad v' = \frac{dv}{dx}$

Derivatives of Trigonometric Functions

y	dy/dx
$\sin x$	$\cos x$
$\cos x$	$-\sin x$
$\tan x$	$\sec^2 x$
$\sin u(x)$	$(\cos u)\ \frac{du}{dx}$
$\cos u(x)$	$(-\sin u)\ \frac{du}{dx}$
$\tan u(x)$	$(\sec^2 u)\ \frac{du}{dx}$