DIFREÁIL (DIFFERENTIATION)

$f(x)$	$f'(x) \equiv \frac{d}{dx}[f(x)]$
x^n	nx^{n-1}
$\ln x$	$\frac{1}{x}$
$\cos x$	$-\sin x$
$\sin x$	$\cos x$
$\tan x$	$\sec^2 x$
$\sec x$	$\sec x \tan x$
$\operatorname{cosec} x$	$-\operatorname{cosec} x \cot x$
$\cot x$	$-\operatorname{cosec}^2 x$
e^x	e^x
e^{ax}	ae^{ax}
a^x	$a^x \ln a$
$\cos^{-1}\frac{x}{a}$	$-\frac{1}{\sqrt{a^2-x^2}}$
$\sin^{-1}\frac{x}{a}$	$\frac{1}{\sqrt{a^2-x^2}}$
$\tan^{-1}\frac{x}{a}$	$\frac{a}{a^2+x^2}$
$\sec^{-1}\frac{x}{a}$	$\frac{a}{x\sqrt{x^2-a^2}}$
$\operatorname{cosec}^{-1}\frac{x}{a}$	$-\frac{a}{x\sqrt{x^2-a^2}}$
$\cot^{-1}\frac{x}{a}$	$-\frac{a}{a^2+x^2}$
$\sinh x$	$\cosh x$
$\cosh x$	$\sinh x$
$\tanh x$	$\operatorname{sech}^2 x$
$\coth x$	$-\operatorname{cosech}^2 x$
$\operatorname{sech} x$	$-\operatorname{sech} x \tanh x$
$\operatorname{cosech} x$	$-\operatorname{cosech} x \coth x$
$\sinh^{-1} x$	$\frac{1}{\sqrt{x^2+1}}$
$\cosh^{-1} x$	$\frac{1}{\sqrt{x^2-1}}$
$\tanh^{-1} x$	$\frac{1}{1-x^2}$

SUIMEÁIL (INTEGRATION)

Glactar $a>0$ agus fágtar tairisigh na suimeála ar lár.

We take $a>0$ and omit constants of integration.

$f(x)$	$\int f(x)\,dx$
x^n $(n \neq -1)$	$\frac{x^{n+1}}{n+1}$
$\frac{1}{x}$	$\ln \lvert x \rvert$
$\cos x$	$\sin x$
$\sin x$	$-\cos x$
$\tan x$	$\ln \lvert \sec x \rvert$
$\sec x$	$\ln \lvert \sec x + \tan x \rvert$
$\operatorname{cosec} x$	$\ln \lvert \tan \frac{x}{2} \rvert$
$\cot x$	$\ln \lvert \sin x \rvert$
e^x	e^x
e^{ax}	$\frac{1}{a} e^{ax}$
a^x	$\frac{a^x}{\ln a}$
$\frac{1}{\sqrt{a^2+x^2}}$	$\ln \lvert \frac{x+\sqrt{a^2+x^2}}{a} \rvert$
$\frac{1}{\sqrt{a^2-x^2}}$	$\sin^{-1}\frac{x}{a}$
$\frac{1}{x^2+a^2}$	$\frac{1}{a}\tan^{-1}\frac{x}{a}$
$\frac{1}{x\sqrt{x^2-a^2}}$	$\frac{1}{a}\sec^{-1}\frac{x}{a}$
$\frac{1}{\sqrt{x^2-a^2}}$	$ln \lvert \frac{x+\sqrt{x^2-a^2}}{a} \rvert$
$\frac{1}{a^2-x^2}$	$\frac{1}{2a}\ln \lvert \frac{a+x}{a-x} \rvert$

Differentiation

$\coth^{-1} x$	$-\frac{1}{x^2-1}$
$\operatorname{sech}^{-1} x$	$-\frac{1}{x\sqrt{1-x^2}}$
$\operatorname{cosech}^{-1} x$	$-\frac{1}{x\sqrt{x^2+1}}$

Torthaí agus Líonta:
Products and Quotients:

$$y = uv\ ;\ \frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$$

$$y = \frac{u}{v}\ ;\ \frac{dy}{dx} = \frac{v\frac{du}{dx} - u\frac{dv}{dx}}{v^2}$$

Foirmlí áisiúla:
Useful formulae:

$\sinh^{-1} x = \ln\left(x+\sqrt{x^2+1}\right)$ $(-\infty<x<\infty)$

$\cosh^{-1} x = \ln\left(x+\sqrt{x^2-1}\right)$ $(x\geqslant 1)$

$\tanh^{-1} x = \frac{1}{2}\ln\frac{1+x}{1-x}$ $(-1<x<1)$

Integration

$\sinh x$	$\cosh x$
$\cosh x$	$\sinh x$
$\tanh x$	$\ln \cosh x$
$\coth x$	$\ln \lvert \sinh x \rvert$
$\operatorname{sech} x$	$\tan^{-1}(\sinh x)$
$\operatorname{cosech} x$	$\ln \left\lvert \tanh \frac{x}{2} \right\rvert$
$\cos^2 x$	$\frac{1}{2}[x + \frac{1}{2}\sin 2x]$
$\sin^2 x$	$\frac{1}{2}[x - \frac{1}{2}\sin 2x]$
$\cosh^2 x$	$\frac{1}{2}[x + \frac{1}{2}\sinh 2x]$
$\sinh^2 x$	$\frac{1}{2}[-x + \frac{1}{2}\sinh 2x]$
$\frac{1}{x\sqrt{a^2-x^2}}$	$-\frac{1}{a}\operatorname{sech}^{-1}\frac{x}{a}$
$\frac{1}{x\sqrt{x^2+a^2}}$	$-\frac{1}{a}\operatorname{cosech}^{-1}\frac{x}{a}$

Suimeáil trí mhíreanna:
Integration by parts:

$$\int u\,dv = uv - \int v\,du$$

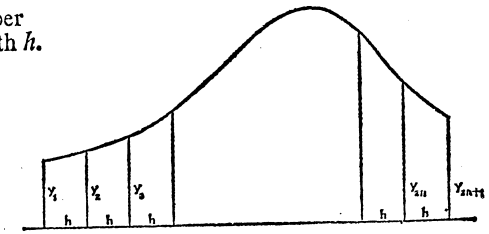
Teoragán Taylor (Taylor's Theorem):

$$f(x+h) = f(x) + hf'(x) + \frac{h^2}{2!}f''(x) + \ldots + \frac{h^r}{r!}f^r(x) + \ldots$$

Riail Shimpson (Simpson's Rule):

Corr-uimhir ordanáidí iad $y_1, y_2, \ldots y_{2n-1}$ fad h óna chéile.

$y_1, y_2, \ldots y_{2n+1}$ is an odd number of ordinates at intervals of length h.



Achar (Area) $\approx \frac{1}{3}h\{y_1+y_{2n+1}+2(y_3+y_5+\ldots y_{2n-1})+4(y_2+y_4+\ldots y_{2n})\}$