http://www.mbstudent.com/maths-examples.html

Indefinite integrals of some basic functions

$$\int dx = x + C$$

$$\int x^p \cdot dx = \frac{x^{p+1}}{p+1} + C$$

$$\int \frac{1}{x} \cdot dx = \int x^{-1} \cdot dx = \ln|x| + C$$

$$\int a^x \cdot dx = \frac{a^x}{\ln a} + C$$

$$\int e^x \cdot dx = e^x + C$$

$$\int \sin x \cdot dx = -\cos x + C$$

$$\int \cos x \cdot dx = \sin x + C$$

$$\int \frac{1}{\cos^2 x} \cdot dx = \tan x + C$$

$$\int \frac{1}{\sin^2 x} \cdot dx = -\cot x + C$$

$$\int \frac{1}{x^2 + 1} \cdot dx = \arctan x + C$$

$$\int \frac{1}{\sqrt{1 - x^2}} \cdot dx = \arcsin x + C$$

$$\int \sinh x \cdot dx = \cosh x + C\,; \sinh = \frac{e^x - e^{-x}}{2}$$

$$\int \cosh x \cdot dx = \sinh x + C\,;\ \cosh = \frac{e^x + e^{-x}}{2}$$

$$\int \frac{1}{\sinh^2 x} \cdot dx = -\coth x + C$$

$$\int \frac{1}{\cosh^2 x} \cdot dx = \tanh x + C$$

Basic theorem about integrals calculation

Integral calculation by parts. If functions f(x) and g(x) have continuous derivatives then

$$\int f'(x)\cdot g(x)\cdot dx = f(x)\cdot g(x) - \int f(x)\cdot g'(x)\cdot dx$$

Example

$$\int x\cdot \sin x\cdot dx = \begin{Bmatrix} f'(x) = \sin x & g(x) = x \\ f(x) = -\cos x & g'(x) = 1 \end{Bmatrix}$$

Integral calculation by substation. If function $f(x)$ is continuous and function $g(x)$ has continuous derivative and exist assumption $f(x)og(x)$ then

$$\int f\big(g(x)\cdot g'(x)\big)\cdot dx = \left(\int f(x)\cdot dx\right)og(x)$$

Example

$$\int (2\cdot x+1)^{10}\cdot dx = \begin{Bmatrix} 2\cdot x+1 = t & g(x)\to t \\ 2\cdot dx = dt & g'(x)\cdot dx \to dt \\ dx = \dfrac{dt}{2} & \end{Bmatrix}$$