Formulário para Cálculo II e Cálculo Aplicado II

Tabela de Integrais

$\int x^n\,dx$	$\frac{x^{n+1}}{n+1}+c \quad (n\neq -1)$
$\int e^x\,dx$	e^x+c
$\int \operatorname{sen}(x)\,dx$	$-\cos(x)+c$
$\int \cos(x)\,dx$	$\operatorname{sen}(x)+c$
$\int \sec^2(x)\,dx$	$\operatorname{tg}(x)+c$
$\int \operatorname{cossec}^2(x)\,dx$	$-\operatorname{cot}(x)+c$
$\int \sec(x)\operatorname{tg}(x)\,dx$	$\sec(x)+c$
$\int \frac{1}{x}\,dx$	$\ln\lvert x\rvert+c$
$\int \sec(x)$	$\ln\lvert\sec(x)+\operatorname{tg}(x)\rvert+c$

Identidades Trigonométricas

$$\operatorname{sen}^2\theta+\cos^2\theta=1\quad \operatorname{tg}^2\theta+1=\sec^2\theta$$
$$\cos^2 x=\frac{1+\cos(2x)}{2}$$
$$\operatorname{sen}^2 x=\frac{1-\cos(2x)}{2}$$

Funções Trigonométricas

$$\operatorname{tg}(\theta)=\frac{\operatorname{sen}(\theta)}{\cos(\theta)} \qquad \operatorname{cotg}(\theta)=\frac{\cos(\theta)}{\operatorname{sen}(\theta)}$$
$$\sec(\theta)=\frac{1}{\cos(\theta)} \qquad \operatorname{cossec}(\theta)=\frac{1}{\operatorname{sen}(\theta)}$$

Outras Identidades

$$\operatorname{sen}(x)\cos(y)=\tfrac{1}{2}[\operatorname{sen}(x+y)+\operatorname{sen}(x-y)]$$
$$\cos(x)\cos(y)=\tfrac{1}{2}[\cos(x+y)+\cos(x-y)]$$
$$\operatorname{sen}(x)\operatorname{sen}(y)=\tfrac{1}{2}[\cos(x-y)-\cos(x+y)]$$

Propriedades de Integrais

$$\int_a^b f(x)\,dx=-\int_b^a f(x)\,dx$$
$$\int_a^b f(x)\,dx=\int_a^c f(x)\,dx+\int_c^b f(x)\,dx$$
$$\int_a^b cf(x)\,dx=c\int_a^b f(x)\,dx$$
$$\int_a^b (f+g)\,dx=\int_a^b f\,dx+\int_a^b g\,dx$$

TFC e Regras de Integração

$$\int_a^b f(x)\,dx=F(b)-F(a)$$
$$\int f(g(x))g'(x)\,dx=\int f(u)\,du$$
$$\int u\,dv=uv-\int v\,du$$

Substituições Trigonométricas

$$\sqrt{a^2-x^2} \quad\to\quad x=a\operatorname{sen}\theta$$
$$\sqrt{a^2+x^2} \quad\to\quad x=a\operatorname{tg}\theta$$
$$\sqrt{x^2-a^2} \quad\to\quad x=a\sec\theta$$

Área/Volume/Comprimento de Arco

$$A=\int_a^b f(x)\,dx$$
$$A=\int_a^b [f(x)-g(x)]\,dx$$
$$V=\int_a^b \pi(f(x))^2\,dx$$
$$V=\int_a^b 2\pi x f(x)dx$$
$$l(C)=\int_a^b \sqrt{1+[f'(x)]^2}\,dx$$

Valor Médio e Trabalho

$$f_{med}=\frac{1}{b-a}\int_a^b f(x)\,dx$$
$$w=\int_a^b F(x)\,dx$$

Integrais Impróprias

$$\int_a^{+\infty} f(x)\,dx=\lim_{t\to+\infty}\int_a^t f(x)\,dx \qquad \int_a^b f(x)dx=\lim_{t\to b^-}\int_a^t f(x)dx$$
$$\int_{-\infty}^b f(x)\,dx=\lim_{t\to-\infty}\int_t^b f(x)\,dx \qquad \int_a^b f(x)dx=\lim_{t\to a^+}\int_t^b f(x)dx$$
$$\int_{-\infty}^{+\infty} f(x)\,dx=\int_{-\infty}^c f(x)\,dx+\int_c^{+\infty} f(x)\,dx$$