Universidade de Aveiro
Departamento de Matemática

Cálculo II - Agrup. IV **2018/19**

Formulário (Primitivas)

Função	Primitiva
$u^r u',\ {\scriptstyle r\neq -1}$	$\dfrac{u^{r+1}}{r+1}$
$\dfrac{u'}{u}$	$\ln\lvert u\rvert$
$u'e^u$	e^u
$u'a^u,\ {\scriptstyle a\in\mathbb{R}^+\setminus\{1\}}$	$\dfrac{a^u}{\ln a}$
$u'\cos u$	$\operatorname{sen} u$
$u'\operatorname{sen} u$	$-\cos u$
$u'\sec^2 u$	$\operatorname{tg} u$
$u'\operatorname{cosec}^2 u$	$-\operatorname{cotg} u$
$u'\sec u$	$\ln\lvert\sec u+\operatorname{tg} u\rvert$
$u'\operatorname{cosec} u$	$-\ln\lvert\operatorname{cosec} u+\operatorname{cotg} u\rvert$
$\dfrac{u'}{\sqrt{1-u^2}}$	$\operatorname{arcsen} u$
$\dfrac{u'}{1+u^2}$	$\operatorname{arctg} u$

Algumas fórmulas trigonométricas:

$$\cos^2 x = \frac{1+\cos(2x)}{2}$$

$$\operatorname{sen}^2 x = \frac{1-\cos(2x)}{2}$$

$$\cos(x+y) = \cos x\cos y - \operatorname{sen} x\operatorname{sen} y$$

$$\operatorname{sen}(x+y) = \operatorname{sen} x\cos y + \cos x\operatorname{sen} y$$

Formulário (Transformada de Laplace)

Função	Transformada
$t^n\ \ (n\in\mathbb{N}_0)$	$\dfrac{n!}{s^{n+1}}\,,\ s>0$
$\mathrm{e}^{at}\ \ (a\in\mathbb{R})$	$\dfrac{1}{s-a}\,,\ s>a$
$\operatorname{sen}(at)\ \ (a\in\mathbb{R})$	$\dfrac{a}{s^2+a^2}\,,\ s>0$
$\cos(at)\ \ (a\in\mathbb{R})$	$\dfrac{s}{s^2+a^2}\,,\ s>0$
$\operatorname{senh}(at)\ \ (a\in\mathbb{R})$	$\dfrac{a}{s^2-a^2}\,,\ s>\lvert a\rvert$
$\cosh(at)\ \ (a\in\mathbb{R})$	$\dfrac{s}{s^2-a^2}\,,\ s>\lvert a\rvert$
$f(t)+g(t)$	$F(s)+G(s)\,,\ s>s_f,s_g$
$\alpha f(t)\ \ (\alpha\in\mathbb{R})$	$\alpha F(s)\,,\ s>s_f$
$\mathrm{e}^{\lambda t}f(t)\ \ (\lambda\in\mathbb{R})$	$F(s-\lambda)\,,\ s>s_f+\lambda$
$t^n f(t)\ \ (n\in\mathbb{N})$	$(-1)^n F^{(n)}(s)\,,\ s>s_f$
$H_a(t)f(t-a)\ \ (a>0)$	$\mathrm{e}^{-as}F(s)\,,\ s>s_f$
$f(at)\ \ (a>0)$	$\dfrac{1}{a}\,F\left(\dfrac{s}{a}\right)\,,\ s>a\,s_f$
$f^{(n)}(t)\ \ (n\in\mathbb{N})$	$s^nF(s)-\sum_{k=1}^{n} s^{n-k}f^{(k-1)}(0)\,,$ $s>s_f,s_{f'},\ldots,s_{f^{(n-1)}}$
$(f*g)(t)$	$F(s)G(s)\,,\ s>s_f,s_g$
$\int_0^t f(\tau)\,d\tau$	$\dfrac{1}{s}F(s)\,,\ s>0,\ s_f$

Notas:

1. F denota a transformada de Laplace da função f, $F(s)=\mathcal{L}\{f(t)\}(s)$, $s>s_f$.
2. Para cada linha dos quadros acima, podem haver restrições adicionais a considerar para que a fórmula indicada nessa linha seja válida.