

Formulário Básico de Derivação e Integração

Cuidado: Humanos devem usar aplicativos ...

Derive

A. Operações

$$(u + v)' = u' + v'$$

$$(u \cdot v)' = u \cdot v' + v \cdot u'$$

$$(u^n)' = n \cdot u^{n-1} \cdot u'$$

$$(u^v)' = v \cdot u^{v-1} \cdot u' + u^v \cdot \ln(u) \cdot u'$$

$$\left(\frac{u}{v}\right)' = \frac{u'v - v'u}{v^2}$$

$$\begin{aligned} [(u \circ v)(x)]' &= [u(v(x))]' \\ &= u'(v(x)) \cdot v'(x) \end{aligned}$$

B. Funções Usuais

$$1. \quad \text{sen } u \Rightarrow (\text{cos } u) \cdot u'$$

$$2. \quad \text{cos } u \Rightarrow -(\text{sen } u) \cdot u'$$

$$3. \quad \text{tg } u \Rightarrow (\text{sec}^2 u) \cdot u'$$

$$4. \quad \text{sec } u \Rightarrow (\text{sec } u \cdot \text{tg } u) \cdot u'$$

$$5. \quad \text{cotg } u \Rightarrow (-\text{cossec}^2 u) \cdot u'$$

$$6. \quad \text{cossec } u \Rightarrow (-\text{cossec } u \cdot \text{cot } u) \cdot u'$$

$$7. \quad e^u \Rightarrow e^u \cdot u'$$

$$8. \quad a^u \Rightarrow a^u \cdot \ln(a) \cdot u'$$

$$9. \quad \ln(u) \Rightarrow u' / u$$

$$10. \quad \log_a(u) \Rightarrow (\log_a e) \cdot u' / u$$

$$11. \quad \arcsen(u) \Rightarrow \frac{u'}{\sqrt{1-u^2}}$$

$$12. \quad \arccos(u) \Rightarrow -\frac{u'}{\sqrt{1-u^2}}$$

$$13. \quad \text{arctg}(u) \Rightarrow \frac{u'}{1+u^2}$$

$$14. \quad \text{arccot}(u) \Rightarrow -\frac{u'}{1+u^2}$$

$$15. \quad \text{arcsec}(u) \Rightarrow \frac{u'}{|u|\sqrt{u^2-1}}$$

$$16. \quad \text{arccossec}(u) \Rightarrow -\frac{u'}{|u|\sqrt{u^2-1}}$$

Integre...

C. Operações

$$\int (u + v) = \int u + \int v$$

$$\int u^n \cdot du = \frac{u^{n+1}}{n+1} + C$$

$$\int u \cdot v' = u \cdot v - \int u' \cdot v$$

D. Situações Usuais

$$1. \quad \int \frac{du}{u} \Rightarrow \ln|u| + C$$

$$2. \quad \int e^u du \Rightarrow e^u + C$$

$$3. \quad \int a^u du \Rightarrow \frac{1}{\ln(a)} \cdot a^u + C$$

$$4. \quad \int a^u du \Rightarrow \frac{1}{\ln(a)} \cdot a^u + C$$

$$5. \quad \int \text{sen } u \cdot du \Rightarrow -\text{cos } u + C$$

$$6. \quad \int \text{cos } u \cdot du \Rightarrow \text{sen } u + C$$

$$7. \quad \int \text{tg } u \cdot du \Rightarrow \ln|\text{sec } u| + C$$

$$8. \quad \int \text{cotg } u \cdot du \Rightarrow \ln|\text{sen } u| + C$$

$$9. \quad \int \text{sec } u \cdot du \Rightarrow \ln|\text{sec } u + \text{tg } u| + C$$

$$10. \quad \int \text{cossec } u \cdot du \Rightarrow \ln|\text{cossec } u - \text{cot } u| + C$$

$$11. \quad \int \text{sec } u \cdot \text{tg } u \cdot du = \text{sec } u + C$$

$$12. \quad \int \text{cossec } u \cdot \text{cot } u \cdot du = -\text{cossec } u$$

$$13. \quad \int \frac{du}{u^2+a^2} = \frac{1}{a} \cdot \text{arctg} \frac{u}{a} + C$$

$$14. \quad \int \frac{du}{\sqrt{a^2-u^2}} = \arcsen \frac{u}{a} + C$$

$$15. \quad \int \frac{du}{\sqrt{u^2 \pm a^2}} = \ln \left| u + \sqrt{u^2 \pm a^2} \right| + C$$

$$16. \quad \int \frac{du}{\sqrt{u^2-a^2}} = \ln \left| u + \sqrt{u^2-a^2} \right| + C$$