

Lista de exercícios 9

Cálculo I – Turma 2

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Entrega: Terça-feira 26/11/2019

1. Calcule

(a) $\int x \operatorname{sen} x^2 dx$

(b) $\int \operatorname{sen}^5 x \cos x dx$

(c) $\int x^3 \cos x^4 dx$

(d) $\int \frac{2}{x+3} dx$

(e) $\int x \sqrt{1+3x^2} dx$

(f) $\int x e^{-x^2} dx$

(g) $\int \operatorname{sen} x \sqrt{\cos x} dx$

(h) $\int \operatorname{sen} x \sec^3 x dx$

(i) $\int \frac{x}{x+1} dx$

(j) $\int \frac{x+2}{x-1} dx$

(k) $\int \frac{x^2}{x+1} dx$

2. Calcule, realizando a mudança de variável $u = g(x)$.

(a) $\int \frac{x^3}{(16+x^4)^3} dx$

(b) $\int \frac{x^3}{16+x^4} dx$

(c) $\int \frac{1}{x \ln x} dx$

(d) $\int \frac{1}{x(\ln x)^2} dx$

(e) $\int \frac{1}{\sqrt{1-x^2}} dx$

(f) $\int \frac{e^x}{\sqrt{1-e^{2x}}} dx$

3. Calcule, através do método de integração por partes

(a) $\int x e^x dx$

(b) $\int x \operatorname{sen} x dx$

(c) $\int x^2 e^x dx$

(d) $\int x \sec^2 x dx$

(e) $\int e^x \cos x dx$

(f) $\int x^3 \cos(x^2) dx$

(g) $\int \operatorname{sen}^4 x dx$

(h) $\int \ln x dx$

4. Calcule por partes a integral $\int x \ln x dx$:

(a) Fazendo $u = x$ e $dv = \ln(x) dx$ (Logo $v = \int \ln x dx$).

(b) Fazendo $u = \ln(x)$ e $dv = x dx$.

(c) Compare as soluções.