11ª Lista de Exercícios de SMA-353 Cálculo 1

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Cálculo de primitivas

Exercício 1 Calcule (fixe um oportuno intervalo)

(**a**) $\int (3s^2+2s-1)ds$ (**b**) $\int \left(x^3+\frac{1}{x}+\frac{1}{x^3}\right)dx$ (**c**) $\int [\cos 2x+\text{sen}5x]dx$ (**d**) $\int \frac{4}{1+u^2}\,du.$

(**e!**) $\int \text{tg}^2 x\ dx$ (**f**) $\int |x|dx$

Exercício 2 Suponha f contínua em $[-1,1]$. Calcule $\int f(2x-1)dx$ sabendo que $f=F'$.

Exercício 3 Calcule (usando substituição)

(**a**) $\int xe^{x^2}dx$ (**b**) $\int x(2x+1)^{50}dx$ (**c**) $\int \frac{x}{(x^2+1)^5}dx$ (**d**) $\int x^4(x^5+3)^3dx$

(**e**) $\int \text{sen}\,x(1-\cos^2 x)dx$ (**f**) $\int \text{sen}^3 x\ dx$ (**g**) $\int x\frac{1}{\sqrt{1-x^2}}dx$

Exercício 4 Calcule

(**a**) $\int x^3\cos(x^4)dx$ (**b**) $\int \text{sen}^5 x\cos x dx$ (**c**) $\int \text{tg}\,x\sec^2 x dx$ (**d**) $\int \frac{\sec^2 x}{3+2\text{tg}\,x}dx$

(**e**) $\int \left(\frac{5}{x-1}+\frac{2}{x}\right)dx$ (**f**) $\int \frac{1}{a^2+x^2}dx$ (**g**) $\int \frac{1}{x\ln x}dx$ (**h**) $\int \frac{1}{x}\cos(\ln x)dx$

Exercício 5 Calcule

(**a**) $\int \left(e^{-x}+\text{sen}(6x)+\frac{2}{x^5}\right)dx$ (**b**) $\int \left(\sqrt[7]{x^3}+\text{sen}\,\frac{x}{5}\right)dx$ (**c**) $\int \frac{1}{\sqrt{1-x^2}}dx$ (**d**) $\int 13^x\pi^x dx$

(**e**) $\int x^3\sqrt{2+3x^4}dx$ (**f**) $\int (7+\text{sen}\,5x)^2dx$ (**g!**) $\int \sqrt{1+\cos x}\,dx$

Exercício 6 Calcule

(**a**) $\int \frac{x^3}{\sqrt{9+x^2}}\,dx$ (**b**) $\int \frac{x^2dx}{\sqrt{4+x^2}}$ (**c**) $\int \frac{x^2\,dx}{\sqrt{4-x^2}}$ (**d**) $\int \frac{\sqrt{x^2-9}}{x^2}\,dx$

Dica: pode fazer substituições trigonométricas-hiperbólicas.

Gabarito

Exercício 1 (**e**)$tan(x)-x+k:\ k\in\mathbb{R}$

Exercício 6 (**a**)$(9+x^2)^{3/2}/3-9\sqrt{9+x^2}+k:\ k\in\mathbb{R}$

(**b**)$Sh(2SetSh(x/2))-2SetSh(x/2)+k=x\sqrt{4+x^2}/2-2SetSh(x/2)+k:\ k\in\mathbb{R}$

(**c**)$-x\sqrt{4-x^2}/2+2arcsin(x/2)+k:\ k\in\mathbb{R}$ (**d**)$SetCh(x/3)-\sqrt{x^2-9}/x+k:\ k\in\mathbb{R}$