Universidade Veiga de Almeida

Curso: Básico das Engenhrarias

Disciplina: Cálculo Diferencial e Integral I

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10^a Lista de Exercícios

Exercício 1: Calcule as integrais dadas abaixo:

(a) $\int \frac{dx}{3x+2}$ (b) $\int \frac{dx}{ax+b}$ (c) $\int (5x-3)^2 dx$

(d) $\int \frac{x^2 dx}{cos^2(x^3)}$ (e) $\int xe^{(2x^2+1)}dx$ (f) $\int x\sqrt{x^2+1}dx$

(g) $\int \frac{lnxdx}{x}$ (h) $\int \frac{arctgxdx}{1+x^2}$ (i) $\int xcos(x^2)dx$

(j) $\int \frac{sec^2 xdx}{\sqrt{1+2tgx}}$ (k) $\int \frac{sen\sqrt{x}dx}{\sqrt{x}}$ (l) $\int xe^{(-x^2)}dx$

(m) $\int \sqrt{\frac{1+\sqrt{x}}{x}}dx$ (n) $\int \frac{[1+ln(x^2)]^2}{x}dx$ (o) $\int \frac{e^{\frac{1}{x}}}{x^2}dx$

(p) $\int \frac{dx}{(4x+5)^5}$ (q) $\int \frac{dx}{\sqrt{7x+9}}$ (r) $\int \frac{cos\sqrt[3]{x}}{\sqrt[3]{x^2}}dx$

Exercício 2: Resolva as integrais abaixo usando integração por partes:

(a) $\int xsec^2 xdx$ (b) $\int x^2 e^{-3x}dx$ (c) $\int x^2 lnxdx$

(d) $\int sec^3 xdx$ (e) $\int \sqrt{x}lnxdx$ (f) $\int xcsc^2 xdx$

(g) $\int arctgxdx$ (h) $\int senxln(cosx)dx$ (i) $\int \frac{x^3}{\sqrt{1-x^2}}dx$

(j) $\int x^2 senxdx$ (k) $\int x^3 cosxdx$ (l) $\int x^3 e^x dx$

Exercício 3: Calcule as integrais abaixo:

(a) $\int sen^5 xdx$ (b) $\int sen^4 xcos^3 xdx$ (c) $\int sen^3 xcos^2 xdx$

(d) $\int \sqrt{senx}cos^3 xdx$ (e) $\int sen^3 xdx$ (f) $\int sen^2 xcos^5 xdx$

(g) $\int sen^2 xcos^2 xdx$ (h) $\int tg^3 xsec^5 xdx$ (i) $\int tg^3 xsec^4 xdx$

(j) $\int \frac{sen^3 x}{\sqrt{cosx}}dx$ (k) $\int tg^3 xsec^3 xdx$ (l) $\int tg^2 xsec^4 xdx$

Exercício 4: Calcule as integrais abaixo pelo método da substituição trigonométrica:

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

(d) $\int \frac{x^2 dx}{\sqrt{4-x^2}}$ (e) $\int \frac{dx}{x\sqrt{9+x^2}}$ (f) $\int \frac{1}{x^2\sqrt{x^2-25}}dx$

(g) $\int \frac{xdx}{\sqrt{4-x^2}}$ (h) $\int \frac{dx}{\sqrt[2]{(x^2-1)^3}}$ (i) $\int \sqrt{9-4x^2}dx$

Exercício 5: Calcule as integrais abaixo pelo método das frações parciais:

(a) $\int \frac{dx}{x^2-16}$ (b) $\int \frac{dx}{x^3-x}$ (c) $\int \frac{x^2}{x^2+x-6}dx$ (d) $\int \frac{x}{(x+1)(x+2)}dx$