Universidade Veiga de Almeida

Curso: Básico das Engenhrarias

Disciplina: Cálculo Diferencial e Integral I

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Respostas dos Exercícios 3, 4, 5 da 10^a Lista de Exercícios

Exercício 3:

(a) $\int sen^5 x dx = -cosx + \frac{2}{3}cos^3 x - \frac{1}{5}cos^5 x + c$

(b) $\int sen^4 x cos^3 x dx = \frac{1}{5}sen^5 x - \frac{1}{7}sen^7 x + c$

(c) $\int sen^3 x cos^2 x dx = \frac{1}{5}cos^5 x - \frac{1}{3}cos^3 x + c$

(d) $\int \sqrt{senx} cos^3 x dx = \frac{2}{3}(senx)^{\frac{3}{2}} - \frac{2}{7}(senx)^{\frac{7}{2}} + c$

(e) $\int sen^3 x dx = \frac{1}{3}cos^3 x - cosx + c$

(f) $\int sen^2 x cos^5 x dx = \frac{1}{3}sen^3 x - \frac{2}{5}sen^5 x + \frac{1}{7}sen^7 x + c$

(g) $\int sen^2 x cos^2 x dx = \frac{1}{8}x - \frac{1}{32}sen(4x) + c$

(h) $\int tg^3 x sec^5 x dx = \frac{1}{7}sec^7 x - \frac{1}{5}sec^5 x + c$

(i) $\int tg^3 x sec^4 x dx = \frac{1}{4}tg^4 x + \frac{1}{6}tg^6 x + c$

(j) $\int \frac{sen^3x}{\sqrt{cosx}}dx = \frac{2}{5}(cosx)^{\frac{5}{2}} - 2(cosx)^{\frac{1}{2}} + c$

(k) $\int tg^3xsec^3xdx = \frac{1}{5}sec^5x - \frac{1}{3}sec^3x + c$

(l) $\int tg^2xsec^4xdx = \frac{1}{3}tg^3x + \frac{1}{5}tg^5x + c$

Exercício 4:

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

(b) $\int \frac{dx}{\sqrt{4+x^2}} = ln|\sqrt{4+x^2} + x| + c$

(c) $\int \frac{\sqrt{x^2-9}}{x}dx = \sqrt{x^2-9} - 3arcsen(x/3) + c$

(d) $\int \frac{x^2dx}{\sqrt{4-x^2}} = 2arcsen(x/2) - \frac{x\sqrt{4-x^2}}{2} + c$

(e) $\int \frac{dx}{x\sqrt{9+x^2}} = \frac{1}{3}ln \mid \frac{\sqrt{x^2+9}-3}{x} \mid +c$

(f) $\int \frac{1}{x^2\sqrt{x^2-25}}dx = \frac{\sqrt{x^2-25}}{25x} + c$

(g) $\int \frac{xdx}{\sqrt{4-x^2}} = -\sqrt{4-x^2} + c$

(h) $\int \frac{dx}{\sqrt[2]{(x^2-1)^3}} = -\frac{x}{\sqrt{x^2-1}} + c$

(i) $\int \sqrt{9-4x^2}dx = \frac{9}{4}arcsen(\frac{2x}{3}) + \frac{x}{2}\sqrt{9-4x^2} + c$

Exercício 5:

(a) $\int \frac{dx}{x^2-16} = \frac{1}{8} ln \mid \frac{x-4}{x+4} \mid +c$

(b) $\int \frac{dx}{x^3-x} = ln(\frac{\sqrt{\mid x^2-1 \mid}}{\mid x \mid}) + c$

(c) $\int \frac{x^2}{x^2+x-6} dx = x + \frac{4}{5} ln \mid x-2 \mid - \frac{9}{5} ln \mid x+3 \mid +c$

(d) $\int \frac{x}{(x+1)(x+2)} dx = -ln \mid x+1 \mid +2ln \mid x+2 \mid +c$