

UESB-Engenharia de Alimentos

Cálculo II - Lista 2 de Integrais.

1. Calcule as seguintes integrais de funções trigonométricas:

(a) $\int \operatorname{tg}^3 x \cos^4 x dx$

(b) $\int \cos^4 x dx$

(c) $\int \operatorname{tg}^5 x dx$

(d) $\int \frac{\operatorname{sen}^2 x}{\cos^4 x} dx$

(e) $\int 15 \operatorname{sen}^5 x dx$

(f) $\int 15 \operatorname{sen}^2 x \cos^3 x dx$

(g) $\int 48 \operatorname{sen}^2 x \cos^4 x dx$

(h) $\int \cos^6 3x dx$

(i) $\int \frac{-3 \cos^2 x}{\operatorname{sen}^4 x} dx$

(j) $\int \cos^6 x \operatorname{sen}^6 x dx$

(k) $\int \operatorname{sen} 3x \cos 4x dx$

(l) $\int \operatorname{sen} 5x \operatorname{sen} 2x dx$

(m) $\int \cos 5x \cos 3x dx$

(n) $\int \operatorname{sen} 5x \operatorname{sen} 2x dx$

(o) $\int \operatorname{sen} 3x \cos x dx$

(p) $\int \cos 7x \cos 2x dx$

(q) $\int \sec^2 x \operatorname{tg} x dx$

(r) $\int \sec^4 (x/2) dx$

(s) $\int \sec^5 x dx$

(t) $\int \sec^4 x \operatorname{tg}^4 x dx$

$$(u) \int \operatorname{tg}^5 x \sec^4 x dx$$

$$(v) \int \operatorname{tg}^3 x \sec x dx$$

$$(w) \int \cotg^2 x dx$$

$$(x) \int \operatorname{cossec} x dx$$

$$(y) \int \operatorname{cossec}^3 x dx$$

2. Indique, em cada caso, qual a mudança de variável que elimina a raiz do integrando:(G)

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

$$(b) \int \sqrt{1-4x^2} dx$$

$$(c) \int \sqrt{5-4x^2} dx$$

$$(d) \int \sqrt{3+4x^2} dx$$

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

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

$$(g) \int \sqrt{-x^2+4x-3} dx$$

$$(h) \int \sqrt{x^2+2x+2} dx$$

$$(i) \int \sqrt{x-x^2} dx$$

3. Calcule as seguintes integrais usando substituição trigonométrica:

$$(a) \int \frac{dx}{x^2 \sqrt{x^2-5}} dx$$

$$(b) \int \frac{dx}{\sqrt{9-16x^2}} dx$$

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

$$(d) \int (1-4x^2)^{\frac{3}{2}} dx$$

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

$$(f) \int \frac{5x+4}{x^3 \sqrt{x^2+1}} dx$$

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

$$(h) \int \frac{x^5}{\sqrt{x^2+16}} dx$$

4. Calcule as seguintes integrais por frações parciais:

$$(a) \int \frac{x dx}{x^2 - 5x + 6}$$

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

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

$$(d) \int \frac{x^2+1}{(x-2)^3} dx$$

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

$$(f) \int \frac{x^3+x+1}{x^2-4x+3} dx$$

$$(g) \int \frac{x+1}{x^2+9} dx$$

$$(h) \int \frac{dx}{x^2-x-2}$$

$$(i) \int \frac{x+1}{x(x-2)(x+3)} dx$$

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

$$(k) \int \frac{x+5}{x^3-4x^2+4x} dx$$

$$(l) \int \frac{x^5+3}{x^3-4x} dx$$

$$(m) \int \frac{x^3+1}{x^3-x^2-2x} dx$$

$$(n) \int \frac{4x+1}{x^2+6x+12} dx$$

$$(o) \int \frac{4x+1}{x^2+6x+8} dx$$

$$(p) \int \frac{2x^2+4}{x^3-8} dx$$

$$(q) \int \frac{x^4+2x^2-8x+4}{x^3-8} dx$$