CÁLCULO DIFERENCIAL E INTEGRAL

Integral indefinida: Frações parciais

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1. Escreva as funções a seguir na forma de frações parciais

a)
$$f(x) = \frac{2x}{(x+3)(3x+1)}$$
 b) $f(x) = \frac{1}{x^3 + 2x^2 + x}$ c) $f(x) = \frac{x}{x^2 + x - 2}$

$$b) \ f(x) = \frac{1}{x^3 + 2x^2 + x}$$

c)
$$f(x) = \frac{x}{x^2 + x - 2}$$

d)
$$f(x) = \frac{x(x-3)}{x^2 + x + 2}$$

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$$f(x) = \frac{x(x-3)}{x^2+x+2}$$
 e) $f(x) = \frac{x^3+x^2+1}{x^2+x-2}$ f) $f(x) = \frac{5x+3}{x^2-8x+12}$

$$f) \ f(x) = \frac{5x+3}{x^2-8x+12}$$

2. Resolva as integrais das funções propostas no exercício 1.

3. Resolva as integrais

a)
$$\int \frac{5x+1}{(2x+1)(x-1)} dx$$

$$b) \int \frac{dx}{(x+a)(x+b)}$$

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 b) $\int \frac{dx}{(x+a)(x+b)}$ c) $\int \frac{dx}{(x+1)(x+2)(x+3)}$

$$d) \int \frac{x}{x^2 + 6x + 6} \ dx$$

$$e) \int \frac{dx}{x^4}$$

d)
$$\int \frac{x}{x^2 + 6x + 6} dx$$
 e) $\int \frac{dx}{x^4}$ f) $\int \frac{2x^2 + 5}{(x^2 + 1)(x^2 + 4)} dx$

$$g) \int \frac{2x+5}{x^2-4} \ dx$$

$$h) \int \frac{x^3}{x^2 - 4} \ dx$$

g)
$$\int \frac{2x+5}{x^2-4} dx$$
 h) $\int \frac{x^3}{x^2-4} dx$ i) $\int \frac{x^3-1}{4x^3-x} dx$

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

$$j) \int \frac{5x^2 - 2x + 4}{(x - 2)^3} dx$$
 $k) \int \frac{x^2 + 1}{(x - 1)(x + 2)^3} dx$ $l) \int \frac{dx}{x(x + 1)^2}$

$$l) \int \frac{dx}{x\left(x+1\right)^2}$$

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

m)
$$\int \frac{x^3 + x + 1}{x(x^2 + 1)} dx$$
 n) $\int \frac{x^2 - 8x + 7}{(x^2 - 3x - 10)^2} dx$ o) $\int \frac{2x^3 - 6x^2 - 2}{x(x - 2)(x^2 + 1)} dx$

$$o) \int \frac{2x^3 - 6x^2 - 2}{x(x-2)(x^2+1)} \ dx$$

Alguns exercícios foram retirados do livro $Single\ variable\ calculus:\ concepts\ {\cal E}$ contexts (Stewart, 2010).

Referências

Stewart, J. Single variable calculus: concepts and contexts. Brooks/Cole, 4 ed., 630 p., 2010.

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