

Lista de Exercícios VI

June 18, 2012

1. Calcule as integrais indefinidas das funções abaixo:

(a) $\frac{x^2-9}{3}$

(b) $\frac{3x^2-48}{4}$

(c) $\frac{x^2+4x}{2}$

2. Ache a área limitada pela curva dada, o eixo x e as retas verticais dadas:

(a) $y = x^2 + 2x + 1$, $x = -1$ e $x = 1$

(d) $y = \sqrt[3]{3-x}$, $x = -5$ e $x = 3$

(b) $y = \sqrt{x+2}$, $x = 2$ e $x = 7$

(e) $y = \frac{x}{(x^2+1)^2}$, $x = 0$ e $x = 3$

(c) $y = x\sqrt{5-x^2}$, $x = 0$ e $x = \sqrt{5}$

3. Calcule o valor de cada integral definida:

(a) $\int_0^1 x(x^2+2)^3 dx$

(g) $\int_0^1 \sqrt{9-8x} dx$

(b) $\int_{-1}^0 3x^2(3+x^3)^2 dx$

(h) $\int_2^3 \frac{dx}{(3x-5)^{\frac{5}{2}}}$

(c) $\int_0^a x\sqrt{a^2-x^2} dx$

(i) $\int_0^{\sqrt{3}} \frac{x dx}{\sqrt{4-x^2}}$

(d) $\int_0^a x\sqrt{a^2+x^2} dx$

(j) $\int_0^2 \sqrt{1+x^3} x^2 dx$

(e) $\int_{-2}^4 (8-4x+x^2) dx$

(k) $\int_0^b \left(b^{\frac{2}{3}} - x^{\frac{2}{3}}\right)^3 dx$

(f) $\int_8^{27} \left(2x^{-\frac{2}{3}} + 8x^{\frac{1}{3}}\right) dx$

4. Calcule as integrais indefinidas abaixo:

(a) $\int \sin(5x) dx$

(f) $\int \cos^2(x) \sin(x) dx$

(b) $\int \cos(2x-5) dx$

(g) $\int \sin^3(2x) \cos(2x) dx$

(c) $\int \sin(1-9x) dx$

(h) $\int \frac{\sin(\sqrt{x})}{\sqrt{x}} dx$

(d) $\int [3\cos(2x) - 2\sin(3x)] dx$

(i) $\int \frac{\cos(\ln x)}{x} dx$

(e) $\int 2\sin(x) \cos(x) dx$

5. Calcule as integrais definidas abaixo:

(a) $\int_0^{\frac{\pi}{5}} \sin(5x) dx$

(c) $\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{\cos x}{\sin^2 x} dx$

(b) $\int_{-\frac{\pi}{6}}^{\frac{2\pi}{3}} \cos(3x) dx$

(d) $\int_0^{\sqrt{\pi}} x \cos(x^2) dx$

6. Calcule a integral em cada um dos seguintes problemas:

(a) $\int \tan^2(x) \sec^2 x dx$

(d) $\int_{-3}^1 \frac{dx}{\sqrt{3-2x}}$

(b) $\int \sin(2x) dx$

(e) $\int \frac{\sin x}{\cos^2 x} dx$

(c) $\int \frac{dx}{x+2}$