Universidade de São Paulo

Escola Superior de Agricultura "Luiz de Queiroz"

Departamento de Ciências Exatas

LCE 0220 - Cálculo II

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Gabarito da Lista de Exercício: Integração Simples

Nos problemas a seguir, calcule a integral dada. Verifique se o cálculo está correto derivando o resultado.

1. $\int -3\,dx = -3x + c$

2. $\int dx = x + c$

3. $\int x^5\,dx = \frac{x^6}{6} + c$

4. $\int \sqrt{t}\,dt = \frac{2t^{3/2}}{3} + c$

5. $\int \frac{1}{x^2}\,dx = -\frac{1}{x} + c$

6. $\int 3e^x\,dx = 3e^x + c$

7. $\int \frac{2}{\sqrt{t}}\,dt = 4\sqrt{t} + c$

8. $\int x^{-0,3}\,dx = \frac{10}{7}x^{\frac{7}{10}} + c$

9. $\int u^{-2/5}\,du = \frac{5u^{3/5}}{3} + c$

10. $\int \left(\frac{1}{x^2} - \frac{1}{x^3}\right) dx = \frac{1-2x}{2x^2} + c$

11. $\int (3t^2 - \sqrt{5t} + 2)\,dt = -\frac{2}{3}\sqrt{5t^3} + t^3 + 2t + c$

12. $\int (x^{1/3} - 3x^{-2/3} + 6)\,dx = \frac{3}{4}x^{4/3} - 9x^{1/3} + 6x + c$

13. $\int (3\sqrt{y} - 2y^{-3})\,dy = 2y^{3/2} + \frac{1}{y^2} + c$

14. $\int \left(\frac{1}{2y} - \frac{2}{y^2} + \frac{3}{\sqrt{y}}\right) dy = \frac{1}{2}\ln(y) + \frac{2}{y} + 6\sqrt{y} + c$

15. $\int \left(\frac{e^x}{2} + x\sqrt{x}\right) dx = \frac{1}{2}e^x + \frac{2}{5}x^{5/2} + c$

16. $\int \left(\sqrt{x^3} - \frac{1}{2\sqrt{x}} + \sqrt{2}\right) dx = \frac{2}{5}x^{5/2} - \sqrt{x} + \sqrt{2}x + c$

17. $\int u^{1,1}\left(\frac{1}{3u} - 1\right) du = \frac{10}{33}u^{11/10} - \frac{10}{21}u^{21/10} + c$

18. $\int \left(2e^u + \frac{6}{u} + \ln 2\right) du = 2e^u + 6\ln(u) + u\ln(2) + c$

19. $\int \left(\frac{x^2 + 2x + 1}{x^2}\right) dx = x + 2\ln(x) - \frac{1}{x} + c$

20. $\int \frac{x^2 + 3x - 2}{\sqrt{x}}\,dx = \frac{2}{5}\sqrt{x}\left(x^2 + 5x - 10\right) + c$

21. $\int (x^3 - 2x^2)\left(\frac{1}{x} - 5\right) dx = -\frac{5}{4}x^4 + \frac{11}{3}x^3 - x^2 + c$

22. $\int y^3\left(2y + \frac{1}{y}\right) dy = \frac{2}{5}y^5 + \frac{y^3}{3} + c$

23. $\int \sqrt{t}(t^2 - 1)\,dt = \frac{2}{7}t^{7/2} - \frac{2}{3}t^{3/2} + c$

24. $\int x(2x+1)^2\,dx = x^4 + \frac{4}{3}x^3 + \frac{1}{2}x^2 + c$

25. $\int (e^t + 1)^2\,dt = \frac{1}{2}e^{2t} + 2e^t + t + c$

26. $\int e^{-0,02t}(e^{-0,13t} + 4)\,dt = -\frac{100}{15}e^{-0,15t} - 200e^{-0,02t} + c$

27. $\int \left(\frac{1}{3y} - \frac{5}{\sqrt{y}} + e^{-y/2}\right) dy = \frac{1}{3}\ln|y| - 10\sqrt{y} - 2e^{-y/2} + c$

28. $\int \frac{1}{x}(x+1)^2\,dx = \frac{x^2}{2} + 2x + \ln|x| + c$

29. $\int t^{-1/2}(t^2 - t + 2)\,dt = \frac{2}{5}t^{5/2} - \frac{2}{3}t^{3/2} + 4\sqrt{t} + c$

30. $\int \ln(e^{-x^2})\,dx = -\frac{x^3}{3} + c$

HOFFMANN, L.D.; BRADLEY, G.L. **Cálculo: Um curso moderno e suas aplicações**. 10^a ed. Rio de Janeiro. LTC, 2012. 587p.