# Atividade 1 – Integral Indefinida

GABARITO

1) Calcular as integrais indefinidas:

a) $\int dx = x + C$

b) $\int x dx = \frac{x^2}{2} + C$

c) $\int x^3 dx = \frac{x^4}{4} + C$

d) $\int 2x^5 dx = 2\int x^5 dx = \frac{2x^6}{6} + C = \frac{x^6}{3} + C$

e) $\int (2x)^3 2dx = \int 16x^3 dx = 16\int x^3 dx = \frac{16x^4}{4} + C = 4x^4 + C$

f) $\int (3x)^2 3dx = \int 27x^2 dx = 27\int x^2 dx = \frac{27x^3}{3} + c = 9x^3 + C$

g) $\int x^{-3} dx = \frac{x^{-2}}{-2} + C = -\frac{1}{2x^2} + C$

h) $\int (2x^3 - \frac{x^2}{2} + 5x)dx = \frac{2x^4}{4} - \frac{1}{2}.\frac{x^3}{3} + \frac{5x^2}{2} + C = \frac{x^4}{2} - \frac{x^3}{6} + \frac{5}{2}x^2 + C$

i) $\int (\frac{x^4}{3} - 3x^2 - 1)dx = \frac{1}{3}\left(\frac{x^5}{5}\right) - \frac{3x^3}{3} - 1x + C = \frac{x^5}{15} - x^3 - x + C$

j) $\int (x^2 + 1)^2 2x dx = \int (x^4 + 2x^2 + 1)(2x)dx = \int (2x^5 + 4x^3 + 2x)dx = \frac{2x^6}{6} + \frac{4x^4}{4} + \frac{2x^2}{2} + C$

$$= \frac{x^6}{3} + x^4 + x^2 + C$$

k) $\int \sqrt{x}dx \quad = \quad \int x^{1/2}dx = \frac{x^{\frac{3}{2}}}{\frac{3}{2}} + C = \frac{2}{3}x^{\frac{3}{2}} + C$

l) $\int \frac{dx}{\sqrt{x}} \quad = \int x^{-\frac{1}{2}}\,dx = \frac{x^{\frac{1}{2}}}{\frac{1}{2}} + C = 2x^{\frac{1}{2}} + C$

m) $\int \frac{dx}{x^2} \quad = \quad \int x^{-2}dx = \frac{x^{-1}}{-1} + C = -\frac{1}{x} + C$

n) $\int (x + \sqrt{x})dx \quad = \frac{x^2}{2} + \ \frac{2}{3}x^{\frac{3}{2}} + C$

o) $\int \frac{x^4 + x^2 - 5}{x^2}dx \ = \quad \int \left(x^2 + 1 - \frac{5}{x^2}\right) dx = \frac{x^3}{3} + x - \frac{5x^{-1}}{-1} + C = \ \frac{x^3}{3} + x + \frac{5}{x} + C$

p) $\int \frac{x^2 + 2x}{x}dx \quad = \ \int (x + 2)dx = \frac{x^2}{2} + 2x + C$

q) $\int \frac{x^5 + 2x - 5}{x^4}dx \quad = \int (x + \frac{2}{x^3} - \frac{5}{x^4})\ dx = \frac{x^2}{2} + \frac{2x^{-2}}{-2} - \frac{5x^{-3}}{-3} + C = \frac{x^2}{2} - \frac{1}{x^2} + \frac{5}{3x^3} + C$

r) $\int (2y^3 - 5y^{-1/2} + 7y^{2/3})\ dy = \frac{2y^4}{4} - \frac{5y^{\frac{1}{2}}}{\frac{1}{2}} + \frac{7y^{\frac{5}{3}}}{\frac{5}{3}} + C = \frac{y^4}{2} - 10y^{\frac{1}{2}} + \frac{21}{5}y^{\frac{5}{3}} + C$

s) $\int (et^{-3} - 5t^{1/2} + 10t^{-1})\ dt = \frac{et^{-2}}{-2} - \frac{5t^{\left(\frac{3}{2}\right)}}{\frac{3}{2}} + 10\ln(t) + C = -\frac{e}{2t^2} - \frac{10}{3}t^{\frac{3}{2}} + 10\ln(t) + C$

t) $\int (\text{sen}x + \cos x - 3e^x - 3\ln 2)\ dx \ = \quad -\cos(x) + sen(x) - 3e^x - 3ln2x + C$