

# Lista de exercícios 7

## Cálculo I

Prof. Elton Carvalho — ECT — UFRN

Entrega: Segunda-feira 17/06/2019

1. Calcule e verifique sua resposta por derivação.

(a)  $\int 3 \, dx$

(f)  $\int \sin 4t \, dt$

(b)  $\int \sqrt[5]{x} \, dx$

(g)  $\int \left( \frac{1}{2} - \frac{1}{2} \cos 2x \right) dx$

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

(h)  $\int \left( \frac{1}{x} + 4 \sin 3x \right) dx$

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

(i)  $\int \frac{\sin 2x}{\cos x} \, dx$

(e)  $\int \left( e^{4x} + \frac{1}{x^2} \right) dx$

(j)  $\int \left( \frac{1}{3} e^{3x} + \sin 3x \right) dx$

2. (a) Verifique que  $\sin^2 x = \frac{1}{2} - \frac{1}{2} \cos 2x$ .

(b) Calcule  $\int \sin^2 x \, dx$ .

3. (a) Verifique que  $\int \sec x \, dx = \ln(\sec x + \tan x) + k$ , com  $x \in ]-\frac{\pi}{2}, \frac{\pi}{2}[$

(b) Verifique que  $\int \sec x \, dx = \ln(-\sec x - \tan x) + k$ , com  $x \in ]\frac{\pi}{2}, \frac{3\pi}{2}[$

(c) Mostre que  $\int \sec x \, dx = \ln |\sec x + \tan x| + k$

4. Calcule e verifique por derivação

(a)  $\int \cos^2 2x \, dx$

(f)  $\int \sec x \, dx$

(b)  $\int \cos^2 \frac{x}{2} \, dx$

(g)  $\int \sec 3x \, dx$

(c)  $\int \cos^4 x \, dx$

(h)  $\int 3^x \, dx$

(d)  $\int \tan x \, dx$

(i)  $\int \frac{5}{\sqrt{1-x^2}} \, dx$

(e)  $\int \tan^2 x \, dx$

(j)  $\int \frac{\cos x + \sec x}{\cos x} \, dx$