departamento de matemática **universidade de aveiro**

1. Calcule as seguintes famílias de primitivas.

   (a) $\displaystyle\int \left(x - \sqrt{x} + 1\right)\left(\sqrt{x} + 1\right)\, dx$

   (b) $\displaystyle\int \frac{3x+2}{1+9x^2}\, dx$

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

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

   (e) $\displaystyle\int \frac{e^{3x}}{\sqrt[3]{5-e^{3x}}}\, dx$

   (f) $\displaystyle\int \frac{-7x}{\sqrt{9-4x^4}}\, dx$

   (g) $\displaystyle\int \cos\left(\sqrt{x}\right)\, dx$

   (h) $\displaystyle\int 5x\ln(x)\, dx$

   (i) $\displaystyle\int \frac{x^3}{\sqrt{9-x^2}}\, dx$

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

   (k) $\displaystyle\int \frac{1}{x^3 e^{x^{-2}}}\, dx.$

   (l) $\displaystyle\int \sec(x)\,\mathrm{tg}^3(x)\, dx.$

   (m) $\displaystyle\int \frac{8x+3}{4x^2+4x+7}\, dx$

   (n) $\displaystyle\int \mathrm{arcsen}\left(\frac{x}{3}\right)\, dx$

   (o) $\displaystyle\int \sec^5(x)\,\mathrm{sen}(2x)\, dx$

   (p) $\displaystyle\int \frac{\cos(x)}{6-2\,\mathrm{sen}(x)-\cos^2(x)}\, dx$

1. (a) $\frac{2}{5}\sqrt{x^5} + x + C, \quad C \in \mathbb{R};$
   (b) $\frac{1}{6}\ln|9x^2+1| + \frac{2}{3}\operatorname{arctg}(3x) + C, \quad C \in \mathbb{R};$
   (c) $\frac{x^2}{2} - \frac{5}{4}\ln|x^2+2| + \frac{1}{2}\ln|x| + C, \quad C \in \mathbb{R};$
   (d) $\operatorname{arcsen}(x-1) + C, \quad C \in \mathbb{R};$
   (e) $-\frac{1}{2}\sqrt[3]{(5-e^{3x})^2} + C, \quad C \in \mathbb{R};$
   (f) $-\frac{7}{4}\operatorname{arcsen}\left(\frac{2x^2}{3}\right) + C, \quad C \in \mathbb{R};$
   (g) $2\sqrt{x}\operatorname{sen}(\sqrt{x}) + 2\cos(\sqrt{x}) + C, \quad C \in \mathbb{R};$
   (h) $\frac{5x^2}{2}\left(\ln(x) - \frac{1}{2}\right) + C, \quad C \in \mathbb{R};$
   (i) $-\frac{x^2+18}{3}\sqrt{9-x^2} + C, \quad C \in \mathbb{R};$
   (j) $-\frac{4x^3}{3} - \frac{x^2}{2} - 9x - \frac{40}{3}\ln|2-x| + \frac{7}{3}\ln|x+1| + C, \quad C \in \mathbb{R};$
   (k) $\frac{1}{2}e^{-x^{-2}} + C, \quad C \in \mathbb{R};$
   (l) $\frac{1}{3}\sec^3(x) - \sec(x) + C, \quad C \in \mathbb{R};$
   (m) $\ln|4x^2+4x+7| - \frac{1}{2\sqrt{6}}\operatorname{arctg}\left(\frac{2x+1}{\sqrt{6}}\right) + C, \quad C \in \mathbb{R};$
   (n) $\sqrt{9-x^2} + x\operatorname{arcsen}\left(\frac{x}{3}\right) + C, \quad C \in \mathbb{R};$
   (o) $\frac{2}{3}\sec^3(x) + C, \quad C \in \mathbb{R};$
   (p) $\frac{1}{2}\operatorname{arctg}\left(\frac{\operatorname{sen}(x)-1}{2}\right) + C, \quad C \in \mathbb{R};$