Capítulo 10

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1 Exercícios 10.2

1.

$$\int x\,dx$$
$$= \frac{x^2}{2} + k$$

2.

$$\int 3\,dx$$
$$= 3x + k$$

3.

$$\int 3x + 1\,dx$$
$$= \int 3x\,dx + \int 1\,dx + k$$
$$= \frac{3x^2}{2} + k + x + k'$$
$$= \frac{3x^2}{2} + x + k$$

4.

$$\int (x^2 + x + 1)\,dx$$
$$= \int x^2\,dx + \int x\,dx + \int 1\,dx$$
$$= \frac{x^3}{3} + \frac{x^2}{2} + x + k$$

5.

$$\int x^3\,dx$$
$$= \frac{x^4}{4} + k$$

6.

$$\int (x^3 + 2x + 3)\,dx$$
$$= \int x^3\,dx + \int 2x\,dx + \int 3\,dx$$
$$= \frac{x^4}{4} + 2\int x\,dx + 3x + k$$
$$= \frac{x^4}{4} + 2 * \frac{x^2}{2} + 3x + k$$
$$= \frac{x^4}{4} + x^2 + 3x + k$$

7.

$$\int \frac{1}{x^2}\,dx$$
$$= x^{-1}/-1 + k$$
$$= \frac{1}{x} * \frac{1}{-1} + k$$
$$= \frac{-1}{x} + k$$

8.

$$\int (x + \frac{1}{x^3})\,dx$$
$$= \int x\,dx + \int \frac{1}{x^3}\,dx$$
$$= \frac{x^2}{2} + \frac{x^{-2}}{-2} + k$$
$$= \frac{x^2}{2} + \frac{1}{x^2} * \frac{1}{-2} + k$$
$$= \frac{x^2}{2} - \frac{1}{2x^2} + k$$

9.

$$\int \sqrt{x}\,dx$$
$$= \int x^{\frac{1}{2}}\,dx$$
$$= \frac{\sqrt{x^3}}{\frac{3}{2}}$$
$$= \sqrt{x^3} * \frac{2}{3}$$
$$= \frac{2\sqrt{x^3}}{3} + k$$

10.

$$\begin{aligned}
&\int \sqrt[3]{x}\, dx \\
&= \int x^{\frac{1}{3}}\, dx \\
&= \frac{x^{\frac{4}{3}}}{\frac{4}{3}} + k \\
&= \sqrt[3]{x^4} * \frac{3}{4} \\
&= \frac{3\sqrt[3]{x^4}}{4} + k
\end{aligned}$$

11.

$$\begin{aligned}
&\int (x + \frac{1}{x})\, dx \\
&= \int x\, dx + \int \frac{1}{x}\, dx \\
&= \frac{x^2}{2} + \ln x + k
\end{aligned}$$

12.

$$\begin{aligned}
&\int 2 + \sqrt[4]{x}\, dx \\
&= \int 2\, dx + \int \sqrt[4]{x}\, dx \\
&= 2x + \int x^{\frac{1}{4}}\, dx \\
&= 2x + \frac{x^{\frac{1}{4}}}{\frac{5}{4}} + k \\
&= 2x + \frac{\sqrt[4]{x^5}}{\frac{5}{4}} + k \\
&= 2x + \sqrt[4]{x^5} * \frac{4}{5} + k \\
&= 2x + \frac{4\sqrt[4]{x^5}}{5} + k
\end{aligned}$$

13.

$$\int \sqrt{x} + \frac{1}{x^2}\,dx$$
$$= \int \sqrt{x}\,dx + \int \frac{1}{x^2}\,dx$$
$$= \frac{2\sqrt{x^3}}{3} + (-\frac{1}{x}) + k$$
$$= \frac{2\sqrt{x^3}}{3} - \frac{1}{x} + k$$

14.

$$\int (\frac{2}{x} + \frac{3}{x^2})\,dx$$
$$= 2 * \int \frac{1}{x}\,dx + 3 * \int \frac{1}{x^2}\,dx$$
$$= 2\ln(x) + 3 * (\frac{-1}{x}) + k$$
$$= 2\ln(x) + (\frac{-3}{x}) + k$$
$$= 2\ln(x) - \frac{3}{x} + k$$

15.

$$\int (2x^3 - \frac{1}{x^4})\,dx$$
$$= 2 * \int x^3\,dx - (\frac{-1}{3x^3}) + k$$
$$= \frac{x^4}{2} + \frac{1}{3x^3} + k$$

16.

$$\begin{aligned}
&\int sen\alpha x\, dx \\
&= \frac{1}{\alpha}\cos\alpha x + k \\
&= \int senu\frac{du}{\alpha} \\
&= \frac{1}{\alpha}\int senu\, du \\
&= -\frac{1}{\alpha} * (\cos u + k) \\
&= -\frac{1}{\alpha}\cos\alpha x + k
\end{aligned}$$

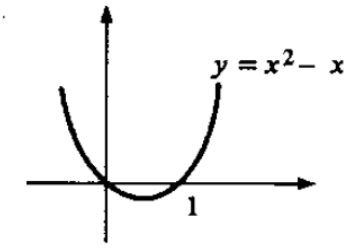
17.

$$\begin{aligned}
&\int cos\alpha x\, dx \\
&= \frac{1}{\alpha} sen\alpha x + k \\
&= \int cosu\frac{du}{\alpha} \\
&= \frac{1}{\alpha}\int cosu\, du \\
&= \frac{1}{\alpha} * (senu + k) \\
&= \frac{1}{\alpha} sen\alpha x + k
\end{aligned}$$

18.

$$\begin{aligned}
&\int e^{2x}\, dx \\
&= \frac{1}{2}\int e^{u}\, du \\
&= \frac{1}{2} * e^{u} + k \\
&= \frac{e^{2x}}{2} + k
\end{aligned}$$

19.



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