Análise Matemática I

folha 5 — 2011'12

1. Calcule

(a) $\int \operatorname{sen}^2 x\,dx$;

(b) $\int \cos^2 x\,dx$;

(c) $\int \operatorname{sen}^3 x\,dx$;

(d) $\int \cos^3 x\,dx$;

(e) $\int \operatorname{sen}^4 x\,dx$;

(f) $\int \cos^4 x\,dx$.

2. Usando primitivação por partes, calcule

(a) $\int \ln x\,dx$;

(b) $\int x\ \operatorname{sen}(2x)\,dx$;

(c) $\int \operatorname{arctg} x\,dx$;

(d) $\int x \cos x\,dx$;

(e) $\int \ln(1-x)\,dx$;

(f) $\int x\ \ln x\,dx$;

(g) $\int x^2 \operatorname{sen} x\,dx$;

(h) $\int x\ \operatorname{sen} x\ \cos x\,dx$;

(i) $\int \ln^2 x\,dx$;

(j) $\int e^x \cos x\,dx$;

(k) $\int \operatorname{arcsen} x\,dx$;

(l) $\int e^{\operatorname{sen} x}\ \operatorname{sen} x\ \cos x\,dx$;

(m) $\int \frac{\operatorname{arcsen}\sqrt{x}}{\sqrt{x}}\,dx$;

(n) $\int x\ \operatorname{arctg} x\,dx$;

(o) $\int x^2\ \ln x\,dx$;

(p) $\int \operatorname{sen}(\ln x)\,dx$;

(q) $\int \operatorname{ch} x\ \operatorname{sen}(3x)\,dx$;

(r) $\int x^3\, e^{x^2}\,dx$.

3. Usando o método de substituição, calcule:

(a) $\int x\ (x+3)^{1/3}\ dx$;

(b) $\int \frac{x}{\sqrt{2-3x}}\,dx$;

(c) $\int \frac{\operatorname{arcsen}\sqrt{x}}{\sqrt{x}}\,dx$;

(d) $\int \frac{e^{2x}}{3+e^x}\,dx$;

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

(f) $\int \sqrt{1-x^2}\,dx$;

(g) $\int \sqrt{1+x^2}\,dx$;

(h) $\int \frac{\sqrt{x}}{x-\sqrt[3]{x}}\,dx$.