

ANALIZA MATEMATYCZNA

LISTA ZADAŃ 11

16.12.2024

1. Oblicz całkę nieoznaczoną $\int f(x) dx$ gdzie f jest dana wzorem:

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|---|---|---|
| (a) $\frac{5x^2 - 12}{(x^2 - 6x + 13)^2}$, | (b) $\arctan(x)$, | (c) $\arctan \sqrt{x}$, |
| (d) $\frac{1}{1 + \sqrt{x+1}}$, | (e) $x^2 \log(x+1)$, | (f) $\frac{x}{(x+1)(2x+1)}$, |
| (g) $\frac{x}{x^2 - 7x + 10}$, | (h) $\frac{x-2}{x^2 - 7x + 12}$, | (i) $\frac{x}{2x^2 - 3x - 2}$, |
| (j) $\frac{4x+3}{(x-2)^3}$, | (k) $\frac{x^3+1}{x^3-x^2}$, | (l) $\frac{x^4}{x^2+1}$, |
| (m) $\frac{1}{(x^2+9)^3}$, | (n) $\frac{x^3+x-1}{(x^2+2)^2}$, | (o) $\frac{\sqrt{x}}{\sqrt{x} - \sqrt[3]{x}}$, |
| (p) $\frac{1}{x\sqrt{x+1}}$, | (q) $\frac{1}{1 + \sqrt[3]{x+1}}$, | (r) $\frac{e^x - 1}{e^x + 1} \quad (t = e^x)$, |
| (s) $\log(1+x^2)$, | (t) $\frac{x^2}{1+x^3}$, | (u) $x \cdot \log(x^2+1)$, |
| (v) $\frac{1}{x^2-x-1}$, | (w) $\frac{7x^6+3x^2+4x}{x^7+x^3+2x^2+4}$, | (x) $\sqrt{x} \cdot \log(x)$, |
| (y) $\frac{e^x}{e^{2x}+1}$, | (z) $\frac{e^{2x}}{e^{2x}+1}$, | (aa) $\frac{e^x}{e^{3x}-1}$, |
| (ab) $\frac{1}{(x+1)\sqrt{x}}$, | (ac) $\frac{\sqrt{x+1}+1}{\sqrt{x+1}-1}$, | (ad) $\frac{1}{x^6+x^4}$, |
| (ae) $\frac{1}{(x^2+2x+2)(x^2-4)}$, | (af) $\frac{1}{\sqrt{1+\sqrt[3]{x+2}}}$, | (ag) $\frac{x^4}{x^{15}-1}$, |
| (ah) $\frac{1}{x^4+1}$, | (ai) $x^2 \arctan(x)$, | (aj) $\frac{2x^2+41x-91}{(x-1)(x+3)(x-4)}$. |

2. Wyraż I_n przy pomocy I_{n-1} lub I_{n-2}

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|--|--------------------------------------|
| (a) $I_n(x) = \int \frac{1}{(x^2+4)^n} dx$, | (b) $I_n(x) = \int x^n e^x dx$, |
| (c) $I_n(x) = \int \sin^n(x) dx$, | (d) $I_n(x) = \int x^n \sin(x) dx$, |
| (e) $I_n(x) = \int \log^n(x) dx$, | (f) $I_n(x) = \int x^n e^{x^2} dx$. |