Calculus II Summary of building block integrals

Todor Milev

2019

Type	а	b	Type a, lin. sub.	Type b, lin. sub
I	$\int \frac{1}{x} dx$	$\int \frac{1}{x^n} dx$	$\int \frac{A}{ax+b} dx$	$\int \frac{A}{(ax+b)^n} dx$
П	$\int \frac{x}{x^2+1} dx$	$\int \frac{x}{\left(x^2+1\right)^n} \mathrm{d}x$	$\int \frac{A(x+\frac{b}{2a})}{ax^2+bx+c} dx$	$\int \frac{A(x+\frac{b}{2a})}{(ax^2+bx+c)^n} dx$
III	$\int \frac{1}{x^2+1} dx$	$\int \frac{1}{\left(x^2+1\right)^n} dx$	$\int \frac{B}{ax^2 + bx + c} dx$	$\int \frac{B}{(ax^2+bx+c)^n} dx$

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where A, B are arbitrary constants and a, b, c are constants with $b^2 - 4ac < 0$. The quadratics in the denominators have no real roots.

We solved building blocks I, II and III

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• We solved building blocks I, II and III in almost complete detail.

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 - Block I, linear substitutions: done in full detail.

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 - Block IIa, IIIa, linear substitutions: done in full detail,

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	1 D - u ul-		2 2 2 4 2 2 4 2 2 4 2 2 4 2 2 4 2 4 2 4	(ax +bx+c)

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- The types in the remaining columns can be transformed to building block ones:
 - Block I, linear substitutions: done in full detail.
 - Block IIa, IIIa, linear substitutions: done in full detail, by means of completing the square.

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- We solved building blocks I, II and III in almost complete detail.
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 - Block I, linear substitutions: done in full detail.
 - Block IIa, IIIa, linear substitutions: done in full detail, by means of completing the square.
 - Block IIb, IIIb, linear substitutions: done by means of completing the square;

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- We solved building blocks I, II and III in almost complete detail.
- The types in the remaining columns can be transformed to building block ones:
 - Block I, linear substitutions: done in full detail.
 - Block IIa, IIIa, linear substitutions: done in full detail, by means of completing the square.
 - Block Ilb, Illb, linear substitutions: done by means of completing the square; computations are analogous and we leave them for exercise.