

- antiderivative - antypochodna
- integral - całka
- indefinite integral - całka nieoznaczona
- definite integral - całka oznaczona
- integrable - całkwalny
- integrand - funkcja podcałkowa
- integration by parts - całkowanie przez części
- inetgration by substitution - całkowanie przez podstawienie
- partial fractions - ułamki proste
- hyperbolic function - funkcja hiperboliczna
- $\sinh x$, $\operatorname{sh} x$ - the hyperbolic sine
- $\cosh x$, $\operatorname{ch} x$ - the hyperbolic cosine
- algebraic function - funkcja niewymierna
- $\int_a^b f(x)dx$ - a definite integral from a to b of function f
- template - szablon
- area - pole
- volume - objętość
- surface - powierzchnia
- surface of revolution - powierzchnia bryły obrotowej
- side-surface - powierzchnia boczna
- complete surface - całkowita powierzchnia
- solid, space figure - bryła
- solid of revolution - bryła obrotowa
- length - długość
- curve - krzywa

Exercise 1. Read out loud the following example:

$$(1) \int \ln x dx =_{(2)} \int (\ln x) \cdot 1 dx =_{(3)} \left| \begin{array}{ll} f(x) = \ln x & f'(x) = \frac{1}{x} \\ g'(x) = 1 & g(x) = x \end{array} \right| =_{(4)} x \ln x - \int \frac{x}{x} dx =_{(5)} x \ln x - \int 1 dx =_{(6)}$$

$$x \ln x - x + C \stackrel{(7)}{=} x(\ln x - 1) + C.$$

Solution:

- (1) The (indefinite) integral of the natural logarithm of x is equal to
- (2) the integral of the natural logarithm of x times one.
- (3) I am going to use the method of parts. Let f of x be equal to the natural logarithm of x and let g of x be equal to x . Then, f prime of x will be one over x and g prime of x will be equal to x .
- (4) After using the method of parts, the integral will be equal to x times the natural logarithm of x minus the integral of x over x .
- (5) It simplifies to x times the natural logarithm of x minus the integral of one.
- (6) The result is x times the natural logarithm of x minus x plus a constant,
- (7) which may be written in a more compact way as x times, open brackets, the natural logarithm of x minus one, close brackets plus a constant.