Answer on Question #52458 – Math – Integral Calculus

$$\int \left(x + \frac{1}{x}\right)^2 dx$$

Show step by step solution.

Solution

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

where C is an arbitrary real constant.

We used the following formulas:

$\int (f(x) + g(x))dx = \int f(x)dx + \int g(x)dx,$

$\int Af(x)dx = A\int f(x)dx,$

$\int x^n dx = \frac{x^{n+1}}{n+1} + C,$ where C is an arbitrary real constant, $n \neq -1.$

$(a + b)^2 = a^2 + 2ab + b^2.$

Answer: $\frac{x^3}{3} + 2x + \frac{1}{x} + C.$