Answer on Question #52848 – Math – Integral Calculus

Integrate the following expressions:
a) $\int(2x^3 - 3x^2 + 5x - 2)dx$;
b) $\int(5\sin 2 + 2\cos 4)dx$.

Solution

a) $\int(2x^3 - 3x^2 + 5x - 2)dx = \frac{1}{2}x^4 - x^3 + \frac{5}{2}x^2 - 2x + C$, where C is an arbitrary real constant.

Here the following formulas were used:

$\int(kf(x))dx = k\int f(x)dx$, k is a fixed real constant;

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

$\int\big(f(x) - g(x)\big)dx = \int f(x)dx - \int g(x)dx$,

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

b) $\int(5\sin 2 + 2\cos 4)dx = (5\sin 2 + 2\cos 4)x + C$, where C is an arbitrary real constant.

Here the following formula was used: $\int k dx = kx + C$, where C is an arbitrary real constant, k is a fixed real constant.

$\int(5\sin 2x + 2\cos 4x)dx = \left(-\frac{5}{2}cos2x + \frac{2}{4}sin4x\right) + C = -\frac{5}{2}cos2x + \frac{1}{2}sin4x + C$,
where C is an arbitrary real constant.

Here the following formulas were used:

$\int(kf(x))dx = k\int f(x)dx$, k is a fixed real constant;

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

$\int \sin(ax)\, dx = -\frac{\cos(ax)}{a} + C$,

$\int \cos(bx)\, dx = \frac{\sin(bx)}{b} + C$, where C is an arbitrary real constant, a, b are fixed real constants.

Answer:

a) $\int(2x^3 - 3x^2 + 5x - 2)dx = \frac{1}{2}x^4 - x^3 + \frac{5}{2}x^2 - 2x + C$;
b) $\int(5\sin 2 + 2\cos 4)dx = (5\sin 2 + 2\cos 4)x + C$.