

Answer on Question #52522 – Math - Calculus

$$\int_1^2 (x^2 + x - 2) dx$$

a) 17/6

b) ½

c) 5

d) 14/3

Solution

$$\begin{aligned} \int_1^2 (x^2 + x - 2) dx &= \int_1^2 x^2 dx + \int_1^2 x dx - 2 \int_1^2 dx = \frac{x^3}{3} \Big|_1^2 + \frac{x^2}{2} \Big|_1^2 - 2x \Big|_1^2 = \\ &= \frac{1}{3}(2^3 - 1^3) + \frac{1}{2}(2^2 - 1^2) - 2(2 - 1) = \frac{7}{3} + \frac{3}{2} - 2 = \frac{11}{6} \end{aligned}$$

Here the first fundamental theorem of calculus was used and the following facts:

1) $\int_a^b (f(x) + g(x)) dx = \int_a^b f(x) dx + \int_a^b g(x) dx ;$

2) antiderivatives of x^n are $\frac{x^{n+1}}{n+1} + C$, where n is integer, $n \neq -1$, C is an arbitrary real constant.

Answer: $\int_1^2 (x^2 + x - 2) dx = \frac{11}{6}.$

We don't have correct answer among multiple choice answers.