

Домашнее задание по теме: «Непосредственное интегрирование»

1) $\int (ax + b) dx;$ 2) $\int (ax^2 + bx + c) dx;$
 3) $\int (7 - 3x - x^3) dx;$ 4) $\int x(x+1)(x+2) dx.$
 5) $\int \left(x^{10} - \frac{1}{x^{10}} \right)^2 dx;$ 6) $\int \frac{x^8 - 3x^5 - x^2 + 1}{x^3} dx;$
 7) $\int \frac{(x+1)(x^2 - 3)}{x^2} dx;$ 8) $\int \frac{x^3 - 3x^2 + 3x - 1}{x^2 - x} dx.$

3) $\int \sqrt{x} \sqrt{x} \sqrt{x} dx;$ 4) $\int \frac{(x^2 + 1)(x^2 - 2)}{\sqrt[3]{x^2}} dx.$

1) $\int (3e^x + 5 \cos x) dx;$ 2) $\int (2 \sin x + 2^x) dx;$
 3) $\int (\sqrt[7]{x} + 7^x) dx;$ 4) $\int \frac{2^x + 5^x}{10^x} dx;$
 5) $\int 2^x 3^{2x} dx;$ 6) $\int \frac{\sin 2x}{\sin x} dx;$
 7) $\int \sin^2 \frac{x}{2} dx;$ 8) $\int \operatorname{ctg}^2 x dx.$

a) $\int_1^2 \left(\frac{3}{x^2} + x^2 + 2 \right) dx;$

b) $\int_{-2}^{-1} \left(-\frac{5}{x^2} + x^4 - 3x \right) dx;$

a) $\int_{-1}^1 \frac{8x^3 + 36x^2 + 54x + 27}{2x + 3} dx;$

b) $\int_0^2 \frac{x^3 - 27}{x^2 + 3x + 9} dx;$

$$\text{б)} \int_0^1 \frac{x^4 - 18x^2 + 81}{x^2 - 6x + 9} dx;$$

$$\text{г)} \int_1^2 \frac{x^3 - 64}{x^2 + 4x + 16} dx.$$

$$\text{а)} \int_1^2 \frac{4x^5 - 3x^4 + x^3 - 1}{x^2} dx;$$

$$\text{б)} \int_{-2}^{-1} \frac{5x^7 - 4x^6 + 2x}{x^3} dx;$$

$$\text{в)} \int_2^3 \frac{6x^4 - 4x^3 + 7x^2 - 1}{x^2} dx;$$

$$\text{г)} \int_{-2}^{-1} \frac{3x^6 - 4x^5 - 7x^4 + 3x^2}{x^4} dx.$$

$$\text{в)} \int_2^3 \frac{(x^2 - 3x + 2)(2 + x)}{x - 1} dx;$$

$$\text{г)} \int_{-1}^1 \frac{(9 - x^2)(x^2 - 16)}{x^2 - 7x + 12} dx.$$

$$\text{а)} \int_{\frac{\pi}{2}}^{\pi} \sin x dx; \quad \text{б)} \int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \frac{dx}{\cos^2 x}; \quad \text{в)} \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \cos x dx; \quad \text{г)} \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{dx}{\sin^2 x}.$$

$$\text{a) } \int_0^1 e^x dx; \quad \text{б) } \int_{-1}^1 3e^x dx; \quad \text{в) } \int_{-1}^0 \frac{1}{2} e^x dx; \quad \text{г) } \int_{-2}^1 -2e^x dx.$$

$$\text{a) } \int_0^{\frac{\pi}{4}} (1 + \operatorname{tg}^2 x) dx;$$

$$\text{в) } \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} (\operatorname{ctg}^2 x + 1) dx;$$

$$\text{б) } \int_{\frac{\pi}{3}}^{\frac{\pi}{4}} (3 - 3 \operatorname{ctg}^2 x) dx;$$

$$\text{г) } \int_{\frac{\pi}{6}}^{\frac{\pi}{4}} (1 + 2 \operatorname{tg}^2 x) dx.$$