267. Примеры. $\int (6x^2-3x+5)\,dx.$

Пользуясь правилами II и I (и формулами 3, 2), имеем

$$\int (6x^2-3x+5)\,dx = \int 6x^2\,dx - \int 3x\,dx + \int 5\,dx =$$

$$= 6\int x^2\,dx - 3\int x\,dx + 5\int dx = 2x^3 - \frac{3}{2}x^2 + 5x + C.$$

$$\int (2x^2+1)^3\,dx = \int (8x^6+12x^4+6x^2+1)\,dx =$$

$$= \frac{8}{7}x^7 + \frac{12}{5}x^5 + 2x^3 + x + C.$$

$$\int \left(1+\sqrt{x}\right)^4 dx = \int (1+4\sqrt{x}+6x+4x\sqrt{x}+x^2)\,dx =$$

$$= \int dx + 4\int x^{\frac{1}{2}}\,dx + 6\int x\,dx + 4\int x^{\frac{3}{2}}\,dx + \int x^2\,dx =$$

$$= x + \frac{8}{3}x^{\frac{3}{2}} + 3x^2 + \frac{8}{5}x^{\frac{5}{2}} + \frac{1}{3}x^3 + C.$$

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

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

$$- \int x^{-2}\,dx = \frac{1}{6}x^2 + \frac{1}{3}x - \ln x + \frac{1}{x} + C.$$

$$\int \frac{(x-\sqrt{x})(1+\sqrt{x})}{\sqrt[3]{x}}\,dx = \int \frac{x\sqrt{x}-\sqrt{x}}{\sqrt[3]{x}}\,dx =$$

$$= \int x^{\frac{7}{6}}\,dx - \int x^{\frac{1}{6}}\,dx = \frac{6}{13}x^{\frac{13}{6}} - \frac{6}{7}x^{\frac{7}{6}} + C$$