Урок 9 задание 4

$$\int_2^{+\infty} \frac{dx}{x^2+x-2} = \frac{1}{3}\ln\left(\frac{x-1}{x+2}\right) + C$$

$$\frac{1}{(x-1)(x+2)} = \frac{A}{x-1} + \frac{B}{x+2} = \frac{A(x+2)+B(x-1)}{(x-1)(x+2)}$$

$$\rightarrow A(x+2) + B(x-1) \rightarrow Ax + 2A + Bx - B \rightarrow$$

$$\rightarrow \begin{cases} x(A+B) = 0 \\ 2(A-B) = 1 \end{cases} \rightarrow A = 1/3 \; ; \; B = -1/3$$

$$\frac{1}{(x-1)(x+2)} = \frac{\frac{1}{3}}{x-1} + \frac{\left(-\frac{1}{3}\right)}{x+2} \rightarrow$$

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

$$\frac{1}{3}\int \frac{1}{(x-1)}\,dx = \frac{1}{3}\ln(x-1) \rightarrow$$

$$\rightarrow -\frac{1}{3}\ln(x+2) + \frac{1}{3}\ln(x-1) + C \rightarrow \frac{1}{3}\ln\left(\frac{x-1}{x+2}\right) + C$$