

$$\begin{aligned}
 \text{v4. } \int \frac{x^4 - 2x^3 + 2x}{x^3 - x^2 - x + 1} dx &= \int \frac{(x^3 - x^2 - x + 1) \cdot x - x^3 + x^2 + x - 1 + 1}{x^2(x-1) - x + 1} dx = \\
 &= \int \left(x - 1 + \frac{1}{(x-1)^2(x+1)} \right) dx =
 \end{aligned}$$

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

$$A(x-1)^2 + B(x-1)(x+1) + C(x+1) = 1$$

$$x=1: 2C=1; \quad C=\frac{1}{2}$$

$$x=-1: 4A=1; \quad A=\frac{1}{4}$$

$$A+B=0$$

$$B=-\frac{1}{4}$$

$$\begin{aligned}
 &= \int \left(x - 1 + \frac{1}{4(x+1)} - \frac{1}{4(x-1)} + \frac{1}{2(x-1)^2} \right) dx = \\
 &= \frac{x^2}{2} - x + \frac{\ln|x+1|}{4} - \frac{\ln|x-1|}{4} - \frac{1}{2(x-1)} + C = \\
 &= \frac{x^2}{2} - x + \frac{\ln\left|\frac{x+1}{x-1}\right|}{4} - \frac{1}{2(x-1)} + C
 \end{aligned}$$