

$$2) \int \frac{3x^2 - 17x + 23}{(x-2)(x-3)^2} dx \rightarrow \text{рационална функција}$$

$$\frac{3x^2 - 17x + 23}{(x-2)(x-3)^2} = \frac{A}{x-2} + \frac{B}{x-3} + \frac{C}{(x-3)^2}$$

$$\begin{aligned} 3x^2 - 17x + 23 &= A(x-3)^2 + B(x-2)(x-3) + C(x-2) \\ &= A(x^2 - 6x + 9) + B(x^2 - 5x + 6) + Cx - 2C \\ &= Ax^2 - 6Ax + 9A + Bx^2 - 5Bx + 6B + Cx - 2C \\ &= x^2(A+B) + x(-6A-5B+C) + 9A+6B-2C \end{aligned}$$

$$A+B=3 \Rightarrow \boxed{A=3-B}$$

$$-6A-5B+C=-17$$

$$9A+6B-2C=23$$

$$-6(3-B)-5B+C=-17$$

$$9(3-B)+6B-2C=23$$

$$-18+6B-5B+C=-17$$

$$27-9B+6B-2C=23$$

$$B+C=1$$

$$-3B-2C=-4$$

$$2B+2C=2$$

$$-B=-2$$

$$\boxed{B=2}$$

$$\boxed{C=-1}$$

$$\boxed{A=1}$$

$$\int \frac{A}{x-2} dx + \int \frac{B}{x-3} dx + \int \frac{C}{(x-3)^2} dx$$

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

$$= \ln|x-2| + 2 \ln|x-3| + \frac{1}{x-3} + C$$

$$= \ln|x-2| + \ln|x-3|^2 + \frac{1}{x-3} + C$$

$$= \ln|x-2||x-3|^2 + \frac{1}{x-3} + C$$