

$$(4) \int \frac{1}{x \ln(x^3)} dx$$

$$\frac{1}{3} \int \frac{1}{u} du$$

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

$$u = \ln(x^3)$$

$$du = \frac{1}{x^3} \cdot 3x^2 dx$$

$$du = \frac{3}{x} dx$$

$$\frac{1}{3} du = \frac{1}{x} dx$$

$$(5) \int_0^1 \frac{x-1}{x+1} dx$$

$$u = x+1 \quad x = u-1$$

$$du = dx$$

$$u(0) = 1$$

$$u(1) = 2$$

$$\int_1^2 \frac{u-1-1}{u} du = \int_1^2 \frac{u-2}{u} du = \int_1^2 \left(1 - \frac{2}{u}\right) du$$

$$= \int_1^2 1 du - 2 \int_1^2 \frac{1}{u} du = \left. u - 2 \ln |u| \right|_1^2$$

$$(2 - 2 \ln 2) - (1 - 2 \ln 1)$$

$$2 - 2 \ln 2 - 1$$

$$= 1 - 2 \ln 2$$