

§7.4#69

$$\int_2^4 \frac{3}{x} dx = 3 \ln|x| \Big|_2^4 = 3(\ln(4) - \ln(2)) = \boxed{\ln(8)}$$

§7.4#71

$$\int_1^2 \frac{dt}{8-3t} = \int_5^2 \frac{-1}{3u} du$$

$$\begin{array}{ll} u = 8-3t & u(2) = 2 \\ du = -3dt & u(1) = 5 \\ dt = \frac{-1}{3} du & \end{array}$$

$$= -\frac{1}{3} \ln|u| \Big|_5^2$$

$$= -\frac{1}{3} \ln(2) + \frac{1}{3} \ln(5)$$

$$= \boxed{\frac{1}{3}(\ln(5) - \ln(2))}$$

§7.4#73

$$\int_1^e \frac{x^2+x+1}{x} dx = \int_1^e \left(x + 1 + \frac{1}{x}\right) dx$$

$$= \left(\frac{1}{2}x^2 + x + \ln|x|\right) \Big|_1^e$$

$$= \left(\frac{1}{2}e^2 + e + \ln(e)\right) - \left(\frac{1}{2} + 1 + \ln(1)\right)$$

$$= \boxed{\frac{1}{2}e^2 + e - \frac{1}{2}}$$

§7.4#79

$$\int_1^2 10^t dt = \frac{1}{\ln(10)} 10^t \Big|_1^2$$

$$= \frac{1}{\ln(10)} (10^2 - 10^1)$$

$$= \boxed{\frac{90}{\ln(10)}}$$