

置換積分

$y = x + 1$ とおくと $dy/dx = 1$. (公式 3.2 (9))

$$I = \int_1^2 \frac{dx}{\sqrt{(x+1)^2 - 1}} = \int_2^3 \frac{dy}{\sqrt{y^2 - 1}}$$

$$= [\log |y + \sqrt{y^2 - 1}|]_2^3$$

$$= \log(3 + 2\sqrt{2}) - \log(2 + \sqrt{3}) = \log \frac{3 + 2\sqrt{2}}{2 + \sqrt{3}}$$