# PROOF OF FORMULA 3.419.1

$$\int_{-\infty}^{\infty} \frac{x\,dx}{(a+e^x)(1+e^{-x})} = \frac{\ln^2 a}{2(a-1)}$$

The change of variables $x = \ln v$ yields
$$\int_{-\infty}^{\infty} \frac{x\,dx}{(a+e^x)(1+e^{-x})} = \int_0^{\infty} \frac{\ln v\,dv}{(v+a)(v+1)}.$$
The result now follows from entry **4.232.2** that states
$$\int_0^{\infty} \frac{\ln x\,dx}{(x+a)(x+b)} = \frac{\ln^2 a - \ln^2 b}{2(a-b)}.$$