PROOF OF FORMULA 4.297.2

$$\int_0^\infty \ln\left(\frac{ax+b}{bx+a}\right)\,\frac{dx}{(1+x)^2} = 0$$

The change of variables $t = 1/x$ shows that

$$\int_1^\infty \ln\left(\frac{ax+b}{bx+a}\right)\,\frac{dx}{(1+x)^2} = -\int_0^1 \ln\left(\frac{at+b}{bt+a}\right)\,\frac{dt}{(1+t)^2}.$$

Therefore the total integral vanishes.