FORMULA 3.419.6

$$\int_{-\infty}^{\infty} \frac{x^5 \, dx}{(\beta + e^x)(1 - e^{-x})} = \frac{\left(\pi^2 + \ln^2 \beta\right)^2 \left(3\pi^2 + \ln^2 \beta\right)}{6(\beta + 1)}$$