

### PROOF OF FORMULA 3.412

$$\int_0^{\infty} \left\{ \frac{a + be^{-px}}{ce^{px} + g + he^{-px}} - \frac{a + be^{-qx}}{ce^{qx} + g + he^{-qx}} \right\} \frac{dx}{x} = \frac{a + b}{c + g + h} \ln \frac{p}{q}$$

Frullani formula states that

$$\int_0^{\infty} \frac{f(px) - f(qx)}{x} dx = [f(0) - f(\infty)] \ln \left( \frac{q}{p} \right).$$

This formula corresponds to choosing

$$f(x) = \frac{a + be^{-x}}{ce^x + g + he^{-x}}.$$