Line-element equations according to CIE 230:2019

Colour-discrimination function $f(Y_r) = \Delta Y_r$ [0]

$\Delta Y_r = (A_1 + A_2 Y_r)/A_0$ A_0=1,5, A_1=0,0170, A_2=0,0058

$$f_u(Y_r) = \frac{\Delta Y_r}{\Delta Y_{ru}} = \frac{1+b\,Y_r}{1+b} \quad b = A_2 Y_u / A_1 \quad Y_r = Y/Y_u \quad [1]$$

$$F_u(Y_r) = \int \frac{f'_u(Y_r)}{f_u(Y_r)}\, dY_r = \int \frac{b}{1+b\,Y_r}\, dY_r \quad [2]$$

Example for $L^*(Y_r)$ & ΔY_r with $Y_{ru} = Y_r/Y_u = 1$, b=6,141:

$$L^*_u(Y_r) = \frac{L^*(Y_r)}{L^*(Y_{ru})} = \frac{\ln(1+b\,Y_r)}{\ln(1+b)} \quad [3]$$

$$f_u(Y_r) = \frac{\Delta Y_r}{\Delta Y_{ru}} = \frac{1+b\,Y_r}{1+b} \quad [4]$$