LABJND lightness L^*, tristimulus value discrimination dY, contrast (Y/dY), and sensitivity (dY/Y)

LABJND lightness for all colours, $L^*_w=50$ for $Y_u=18$

$$L^* = S_{xn}\,(x_n)^{cn} \qquad (Y_n=100,\ Y>1)$$

For the grey discrimination we get:

$$dL^*/dY = (116/Y_n)\,(1/3)\,(Y/Y_n)^{-2/3}$$

and for $dL^*=1$ (about 3 thresholds) we can write:

$$dY = 3\,(Y_n/116)\,(Y/Y_n)^{2/3}$$

or

$$\log(dY) = \log(\,3\,(Y_n/116)\,) + (2/3)\log(Y/Y_n)$$

therefore in a log-log diagram the slope is (2/3).

for the CIE contrast sensitivity, and for $dL^* = 1$ it is valid:

$$Y/dY = (1/3)\,(116/Y_n)\,(Y/Y_n)^{1/3}$$

or

$$\log(Y/dY) = \log(\,(1/3)\,(116/Y_n)) + (1/3)\log(Y/Y_n)$$