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

CIELAB lightness for all colours $L^*_w=100$:

$$L^* = 116\,(Y/Y_n)^{1/3} - 16 \qquad (Y_n=100,\ Y > 1)$$

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:

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

or

$$\log(dY) = \log(3(Y_n^{1/3})/116) + (2/3)\log(Y)$$

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

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

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

or

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