Lightness L^*_{JND} for the Just Noticeable Difference (JND)

For adjacent surface colours in the range $3{,}6<Y<90$

or the digital range $100/255=0{,}39<Y<100$ it is valid:

$L^*_{JND} = a\,(Y/Y_n)^k$ **[1]** **a=572; Y_n=100; k=0,14=1/7,2**

$= b\,(Y/Y_u)^k$ **[2]** **b=a$(Y_u/Y_n)^k$=450; Y_u=18**

For $Y=Y_u$ it is valid: L^*_{JNDu}**=450.**

Derivation of equation [2] gives with **$1-k$ = 0,86:**

$\delta(L^*_{JND})/\delta Y = c\,(Y/Y_u)^{1-k}$ **[3]** $c = (b\,k)/Y_u$ **= 63/18 = 3,5**

or for the treshold $\delta(L^*_{JND})=1$

$\delta Y = d\,(Y/Y_u)^{1-k}$ **[4]** $d = Y_u/(b\,k)$ **= 18/63 = 0,29**

For the surround lightness L^*_{JNDu}**=450** with $Y=Y_u$the threshold is:

δY_{JNDu} **= 0,29.** This threshold is *independent* of ***k*.**