Weber-Fechner law in CIE 230:2019 for threshold colour differences of surface colours; relations between tristimulus value, lightness and luminance

The *Weber-Fechner* law describes the lightness L^*_r as ***logarithmic*** function of L_r.
The *Stevens* law describes the lightness L^*_{CIELAB} as ***potential*** function of $L_r=Y/5$.

Table 1: CIE tristimulus value *Y*, luminance *L*, and lightness *L

00	**01**	**02**	**03**	**04**	**05**
10	**11**	**12**	**13**	**14**	**15**
20	**21**	**22**	**23**	**24**	**25**
30	**31**	**32**	**33**	**34**	**35**
40	**41**	**42**	**43**	**44**	**45**
50	**51**	**52**	**53**	**54**	**55**
60	**61**	**62**	**63**	**64**	**65**
70	**71**	**72**	**73**	**74**	**75**
80	**81**	**82**	**83**	**84**	**85**
90	**91**	**92**	**93**	**94**	**95**
A0	**A1**	**A2**	**A3**	**A4**	**A5**
B0	**B1**	**B2**	**B3**	**B4**	**B5**
C0	**C1**	**C2**	**C3**	**C4**	**C5**
D0	**D1**	**D2**	**D3**	**D4**	**D5**
E0	**E1**	**E2**	**E3**	**E4**	**E5**

For the lightness range between $L^*_r=-40$ and 40 the constant is: $k=40/\log(5)=57$