Achromatic receptor-response function

$Q_{ab}[x_r/a']$ $\quad a' = a \ln(10)$

with $x_r = \log [L/L_u]$ (L = test luminance)

L_u = surround luminance

$$Q_{ab}[x_r/a'] = \frac{b}{\ln\sqrt{2}} \ln\left[\frac{1}{1+\sqrt{2}\ 10^{(x_r/a')}}\right] - b$$

function values for $b=1$ and $a' = a \ln(10) > 0$:

$Q_{a1}[x_r/a' \to -\infty] = -1$

$Q_{a1}[x_r/a' = 0] = 0$

$Q_{a1}[x_r/a' \to +\infty] = +1$

$x = \log L$, $u = \log L_u$

$x_r = \log [L/L_u]$

$= x - u$