

$$q(l, r) = c(l, r) / N \cdot \log(N \cdot c(l, r) / c_l(l) \cdot c_r(r))$$

$$q(a+b, r) = c(a+b, r) / N \cdot \log(N \cdot c(a+b, r) / c_l(a+b) \cdot c_r(r))$$

$$q(a, r) + q(b, r) = c(a, r) / N \cdot \log(N \cdot c(a, r) / c_l(a) \cdot c_r(r)) \\ + c(b, r) / N \cdot \log(N \cdot c(b, r) / c_l(b) \cdot c_r(r))$$

$$\log(N \cdot c(a, r)) - \log(c_l(a) \cdot c_r(r))$$

$$\log(N \cdot c(b, r)) - \log(c_l(b) \cdot c_r(r))$$