

$$\lim_{x \rightarrow \infty} \left( \frac{ax+b}{ax+c} \right)^{hx+k} \quad (a \neq 0)$$

$$= \lim_{x \rightarrow \infty} e^{(hx+k) \ln \left( \frac{ax+b}{ax+c} \right)}$$

$$= \lim_{x \rightarrow \infty} e^{(hx+k) \ln \left( \frac{ax+b+c-c}{ax+c} \right)}$$

$$= \lim_{x \rightarrow \infty} e^{(hx+k) \ln \left( 1 + \frac{b-c}{ax+c} \right)}$$

$$= \lim_{x \rightarrow \infty} e^{(hx+k) \frac{b-c}{ax+c}}$$

$$= \lim_{x \rightarrow \infty} e^{\frac{(b-c)hx + (b-c)k}{ax+c}}$$

$$= e^{\frac{(b-c)h}{a}}$$