

تالیف ۲۱

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$$q q^r + (m+1)q + m \xrightarrow{q \rightarrow \infty} m^2 q + qm - 1 \quad m=0 \quad m=1$$

$$q \rightarrow \infty \rightarrow a = -\frac{1}{r} \quad \lim_{q \rightarrow \infty} \frac{\sqrt{q} |q + \frac{1}{r}|}{|q^r + \frac{1}{r}|} = \sqrt{r} \tan b$$

$$\frac{\sqrt{q}}{q} = \sqrt{r} \tan b \rightarrow \tan b = \sqrt{\frac{r}{q}} \rightarrow b = \frac{r}{q} \quad \checkmark$$

$$f(x) = \frac{q^r + aq + b}{x-1}$$

$$\begin{aligned} q^r + aq + b = 0 & \xrightarrow{q=1} 1 + a + b = 0 \rightarrow a + b = -1 \\ aq^r + aq + b = 0 & \xrightarrow{q=1} a - a + b = 0 \rightarrow a = b \end{aligned} \quad \left\{ \begin{array}{l} a = r \\ b = -r \end{array} \right.$$

$$\left[\frac{b-r}{r} \right], \left[\frac{-r-r}{r} \right] = \left[-\frac{2r}{r} \right] = -2 \quad \checkmark$$

$$q \rightarrow 1, \omega \rightarrow \frac{r}{q} \quad \lim_{q \rightarrow 1^+} \frac{|q^r + q - r|}{q(1-q)} = \lim_{q \rightarrow 1^+} \frac{(q+r)(q-1)}{q(1-q)} \Rightarrow 1 = \frac{r}{-q} \rightarrow a = r$$

$$q \rightarrow \omega \rightarrow b(\omega - (-\omega)) = \lim_{q \rightarrow \omega^-} \frac{|q^r + q - r|}{q(1-q)} \Rightarrow 1 = \frac{b-r}{-1r} \rightarrow b = -\frac{r}{r} = -1$$

$$f(x) = a(x+1) + b(x+1) = a(x) + a + b(x) + b(x) + b$$

$$a = -b \rightarrow f(x) = b(x) - b(x) = b(x) \quad \frac{a(x)}{f(x)}, \frac{a(x)}{b(x)}, \frac{a}{b} = -1$$

$$f(x) = -ra$$

$$f(b) = -ra$$

$$\frac{a}{f(b)} = \frac{a}{f(b)} = \frac{a}{-ra} = -\frac{1}{r} \quad \checkmark$$

$$\lim_{q \rightarrow a} f(q) = f(a) = r \rightarrow \lim_{q \rightarrow a} \frac{q^r + mq + n}{a-q} = \lim_{q \rightarrow a} \frac{(q-a)(q-ra)}{-(q-a)} \quad \left| \begin{array}{l} q \rightarrow a, mq+n \rightarrow (a-ra) \\ a=r \quad (q-a)=0 \end{array} \right.$$

$$(q-r)(q-r) = q^2 - 2qr + r^2 = q^2 + mq + n \rightarrow m = -2r, n = r^2 \quad n-m = r^2 - (-2r) = r^2 + 2r = 1r \quad \checkmark$$

$$\left. \begin{aligned} 0 &= a-1 \\ 0 &= b \sin\left(\frac{\pi}{a}\right) \\ a' &= 1 - \frac{1}{a} \end{aligned} \right\} \begin{aligned} a-1 &= 1 - \frac{1}{a} \rightarrow a-1 = \frac{a-1}{a} \rightarrow a-1 = \frac{1}{a} \end{aligned}$$

-1

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$$a = \frac{1}{r} \rightarrow -\frac{1}{r} = b \sin\left(\frac{\pi}{r}\right) \rightarrow b = \frac{1}{r} \quad \frac{a}{b} = \frac{\frac{1}{r}}{\frac{1}{r}} = 1$$

$$q \rightarrow 1^+ \quad \frac{|q^r + m q - m - 1|}{m|q-1||q+1||q-1|} = \frac{|(q+m+1)|}{m|q+1|+1} \rightarrow \frac{r+m}{r m+1} = \frac{m}{m+r}$$

-1

$$m^r + 1 + \epsilon m = r m^r + m \rightarrow m^r = \epsilon m - 1 \rightarrow m = -1 \cdot \frac{1}{\epsilon}$$

$$\lim_{q \rightarrow \frac{1}{r}} \frac{|q^r + \epsilon q - \omega|}{r|q^r-1||q-1|} = \frac{\frac{1}{r}}{\frac{1}{r}} = \frac{1}{r}$$

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$$\begin{aligned} a^r a_{\infty} &\rightarrow a = -1 \\ &\rightarrow a_{\infty} = 0 \end{aligned} \quad \begin{aligned} -1 + r - m + 1 &\rightarrow m = r \\ \text{ع. م. م. م.} &\rightarrow -1 \end{aligned}$$

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$$L(q) = \frac{\sqrt{r}|-q-1|}{|q^r+1|} = \frac{\sqrt{r}|q+1|}{|q+1||q^r+1|} = \frac{\sqrt{r}}{r} = \frac{1}{r}$$

-1

$$\begin{aligned} \lim_{q \rightarrow 0} L(q) &= \frac{|q|(|q|+1)}{|q|(|q|+r)} = \frac{r q - 1}{r q + r} \rightarrow \frac{1}{q} = \frac{r q - 1}{r q + r} \rightarrow r q + r = r q - 1 \\ &\rightarrow r q = -1 \rightarrow q = -\frac{1}{r} \end{aligned}$$

$$\lim_{q \rightarrow \frac{1}{r}} L(q) = \frac{|q|(|q|+1)}{|q|(|q|+r)} = \frac{\frac{1}{r}+1}{\frac{1}{r}+r} = \frac{\frac{1+r}{r}}{\frac{1+r^2}{r}} = \frac{1+r}{1+r^2}$$

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