

$$(4) f(x) = \begin{cases} \frac{x^r + mx + n}{a - x} & a \neq x \\ r & a = x \end{cases}$$

$$\rightarrow \frac{\Sigma a^r + r a m + n}{-a} = 0 \rightarrow \Sigma a^r + r a m + n = 0$$

$$(5) f(x) = \begin{cases} (1-a)[x] + (ra^r - 1)[-x] & x \notin \mathbb{Z} \\ b \sin \frac{\pi x}{a} & x \in \mathbb{Z} \end{cases}$$

$$(6) f(x) = \begin{cases} \frac{|x^r + mx - m - 1|}{m|x^r - 1| + |x - 1|} & x \neq 1 \rightarrow \frac{x^r + mx - m - 1}{mx^r - m + x - 1} \\ \frac{m}{m+r} & x = 1 \end{cases}$$

$$(7) f(x) = \frac{\sqrt{r} |ax + a|}{|x^r + (m-r)x + a^r|} \rightarrow a^r + ma - ra + a^r = 0 \rightarrow a^r + a + m - r = 0$$

$$(8) f(x) = \begin{cases} \frac{x^r + |x|}{x^r + a|x|} & x \neq 0 \rightarrow \frac{x(x+1)}{x(x+a)} = \frac{1}{a} \\ \frac{ra-1}{ra+r} & x = 0 \Rightarrow \frac{1}{a} = \frac{ra-1}{ra+r} \rightarrow ra^r - a = ra + r \rightarrow ra^r - ca - r = 0 \end{cases}$$

$$\rightarrow a^r - ca - r = 0 \rightarrow (a-c)(a+1) = 0 \rightarrow \begin{matrix} a = \frac{1}{r} \\ \text{xxx} \end{matrix} \quad \vee \quad \begin{matrix} a = r \\ \text{vvv} \end{matrix}$$

$$\lim_{x \rightarrow r} \frac{\frac{1}{x} + \frac{1}{r}}{\frac{1}{x} + 1} \rightarrow \frac{\frac{r}{r} + \frac{1}{r}}{\frac{1}{r} + 1} = \frac{r}{r+1} = \frac{r}{2} = (14)$$