

$$a(a, a) \rightarrow a^r + a^r/a^r - (a^r)^r + b + ba \rightarrow a^r + (b^r) b^r + ab$$

$$r+a, b=0$$

$$b^r = a$$

$$ab = -r$$

$$b = a + r$$

$$r+a+r \rightarrow a^r + (a+r)^r \rightarrow a = -1, b = r$$

$$a = -1, b = r$$

$$a = -r, b = 1$$

$$-r = a - b \rightarrow a = -r, b = 1$$

$$f(a) = r \rightarrow g(a) = a - r = r \rightarrow a = r$$

$$g(a) = a + r \rightarrow \textcircled{1} \text{ if } g(1) = r \rightarrow \frac{a+r}{1+b} = r \rightarrow a+r = r(1+b) \rightarrow a = r - r(1+b)$$

$$-1 \dots \rightarrow g(1) = 1 \rightarrow \frac{1+b}{-a+r} = -a+r = -1+b$$

$$a-b = r$$

$$-rb = r \rightarrow b = -1$$

$$a+r = r$$

$$b+r = \frac{a}{r}$$

$$a-rb = +1$$

$$a-b = -r$$

$$-rb = -r \rightarrow b = 1$$

$$\text{Domain: } a \geq \frac{r}{r} \quad 2 \text{ rules } (g(a)) : a \leq \frac{b}{r}$$

$$\textcircled{1} \textcircled{2} = \left[\frac{r}{r}, +\infty \right) \cap \left(-\infty, \frac{b}{r} \right] = a = 1$$

$$ra = b - r$$

$$r^2 f - g = k \Rightarrow r^2 f - r - \sqrt{r} - r = k \Rightarrow r^2 f = k + r + \sqrt{r} + r$$

$$r^2 k - 0 - r^2 - k \Rightarrow k = -1, r^2 a - r^2 - k \Rightarrow r^2 a = r^2 + k$$

$$f(a) = \sqrt{m} a + k \rightarrow a \leq m$$

$$\textcircled{1} f \times g = \textcircled{1} \textcircled{2} = (-\infty, m] \cap [-1, +\infty) = [-1, m] = [-b, m]$$

$$r^2 n = r^2 \sqrt{r} - r^2 \sqrt{r} \rightarrow n = \sqrt{r} - \sqrt{r} = r \quad m+n = \sqrt{r} + \sqrt{r} = r$$

$$f(1) = (a - [a]) = \frac{1}{r}$$



$$r^2 n = r^2 \sqrt{r} - r^2 \sqrt{r}$$

$$P(x) = x^r + rx + 1 + qx^r - 4x + 1 + mx^r + nx + m^r$$

$$(1+m)x^r + (n-4)x + m^r + 1 \equiv 0 \pmod{x^r} \rightarrow 1+m=0 \rightarrow m=-1$$

$$\rightarrow n-4=0 \rightarrow n=4$$

$$(r-1)(r-4) \rightarrow pr = -1 \rightarrow p = -1 \rightarrow (-9, -1) \text{ و } (-4, -1)$$

$$m+n+pk = -1+4-11+0 = -7$$

$$1-1 = -1 \rightarrow k = 1$$

الف)

$$\frac{x-r}{x^r - mx^r - 1} \geq 0 \rightarrow x-r=0 \rightarrow x=r$$

$$x^r = t \rightarrow t + r - 1 = 0 \rightarrow t = 1-r \rightarrow \frac{r+4}{r} = -r$$

$$x^r = -rx \rightarrow x^r = t \rightarrow x = r$$

$$\rightarrow x = r$$

$$(-r+4) - \{r\}$$

ب) $\frac{r(x^r-1)}{x^r - rx}$ $\Rightarrow x^r - rx \neq 0 \rightarrow x \neq r \rightarrow r \neq [x]$

$$x + [-r, r] \quad R - (-r, r]$$

الف) $\frac{x^r(x^r-1)}{x^r-1} \geq 0 \rightarrow \frac{-1}{1-1} \geq 0$ $\left\{ \begin{array}{l} |m|+n > 0 \\ |m| \geq 2 \end{array} \right. \quad R^+$

$$\rightarrow |m-r| - m^r \geq 0 \rightarrow |m-r| \geq m^r$$

$$\frac{|m-r|}{m^r} \geq 1 \rightarrow m-r \geq m^r \rightarrow m-r \geq m^r$$

$$\frac{m-r}{m^r} \geq 1 \rightarrow (m-r)(m-1) \leq 0 \rightarrow \frac{-1}{1-1} \geq 0$$

$$|m-1| \neq 0 \rightarrow m \neq 1 \rightarrow m \neq -1$$

$$[-r, 1) - \{-1\}$$

$$|m-r| - 1 \neq k \rightarrow |m-r| - 1 = k$$

$$\rightarrow m-r = k+1 \rightarrow m = k+r$$

$$\rightarrow m-r = -k-1 \rightarrow m = -k+r$$

$$\rightarrow m-r = k-1 \rightarrow m = k+r$$

$$\rightarrow m-r = -k-1 \rightarrow m = -k+r$$

$$k+r = k+1 \rightarrow r = 1$$

$$-k+r = -k-1 \rightarrow r = -1$$

$$k \neq 1 \quad k = -1$$

$$y = rx - [x]$$

$$x \in [-r, -1) \rightarrow y = -x - 1$$

$$x \in [-1, 0) \rightarrow y = -x$$

$$x \in [0, 1) \rightarrow y = 0$$

$$x \in [1, r) \rightarrow y = x - 1$$

$$x \in [r, \infty) \rightarrow y = x - r$$

