

①

$$f(m) = m + [n]$$

$$f(m) = m + [n] \rightarrow [y] = r[n] - [y] = \frac{[n]}{r}$$

$$f^{-1} \rightarrow m + \frac{[y]}{r} \rightarrow y = m - \frac{[m]}{r} = f^{-1}(m)$$

$$m - \frac{[m]}{r} = m + [n] \rightarrow r[n] = -[m] \rightarrow r[n] = 0$$

بما أن $r \neq 0$ ، إذن $[n] = 0$

$$f^{-1} \circ f^{-1}(m) = rm - \frac{r}{r} \rightarrow m = \frac{r}{r}$$

بما أن $m \rightarrow 0$ ، إذن $(rk, rk+1) \quad k \in \mathbb{Z}$

②

$$y = \frac{am+r}{(m+b)}$$

بما أن $b+b=0$ ، إذن $f(m) = f^{-1}(m)$

③

$$\sqrt{m} + \sqrt{y} = r \xrightarrow{f^{-1}} \sqrt{y} + \sqrt{m} = r \rightarrow f^{-1}(m) = f(m)$$

$Df^{-1} = Rf \quad Df = [0, 1] \quad Rf = [0, 1]$

④

$$y = -m + \sqrt{m+c} \quad m \geq -r$$

$$y+m = \sqrt{m+c} \rightarrow (y+m)^2 = (\sqrt{m+c})^2 \rightarrow m^2 + y^2 + 2my = m+c$$

$$m^2 - (m+1) - (m^2 + 14) = 14 - 5m \rightarrow m^2 + m^2 + 2my - m - 5 = 0$$

$$y = \frac{-2m+1 \pm \sqrt{14-5m}}{2} \quad y = \frac{-2(m+1) \pm \sqrt{14-5(m+1)}}{2}$$

بما أن $m=0$ ، إذن $y = \frac{-2 \pm \sqrt{14-5}}{2}$

⑤

$$g(m) = rf(m) - 1$$

$$g^{-1}(m) = a f^{-1}\left(\frac{a+b}{c}\right) + d$$

$$g(m) = rf(m) - 1 \xrightarrow{g^{-1}} g = rf(m) - 1 \rightarrow f^{-1}\left(\frac{m+1}{r}\right) = y \rightarrow y = \frac{f^{-1}(m+1)}{r}$$

بما أن $b=1, c=r, a=1, d=r$ ، إذن $\frac{a+d}{rb} = \frac{1+r}{r}$

⑥

$$f(m) = m + r\sqrt{m} + 1 - 1$$

$$y = (\sqrt{m} + 1)^2 - 1$$

$$m+1 = (\sqrt{y} + 1)^2 \xrightarrow{\text{بما أن}} \sqrt{y} + 1 = \sqrt{m+1}$$

$$\sqrt{y} = \sqrt{m+1} - 1 \rightarrow y = (\sqrt{m+1} - 1)^2 \rightarrow f^{-1}(m) = f^{-1}(m)$$

بما أن $m = r^m + m - 1 \rightarrow m = r^m + m - 1$ ، إذن $r^m = 1 \rightarrow m = 0$

⑦

$$f(m) = m^2 + \varepsilon m \rightarrow y = \sqrt{f^{-1}(m) - n}$$

بما أن $m^2 + \varepsilon m = n \rightarrow m/m^2 + \varepsilon = n/m^2$ ، إذن $m/m^2 = n/m^2 - \varepsilon$

