

-1

الف) $f = \{(r, 2), (n, 3), (r, n^2 - n), (m, r), (-1, r)\}$

$n^2 - n = 2$
 $n(n-1) = 2$
 $n = 2$
 $m = 3$

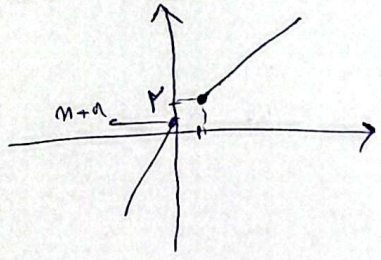
ب) $f = \{(-1, 1), (1, 2), (2, 3), (a, m-1), (a, r, n), (m, r)\}$

$m = 2$
 $a = -1$
 $n = 1$

$(a, \frac{r-1}{1})$
 $(\frac{-1+r}{1}, n)$

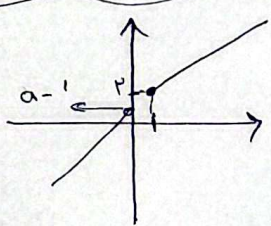
-2

$f(m) = \begin{cases} r^{m-1} & m \geq 1 \\ m+a & m < 1 \end{cases}$



$n+a < r$
 $1+a < r$
 $a < 1$

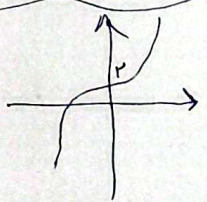
$f(m) = \begin{cases} r^{m-1}, m \geq 1 \\ am+a-1, m \leq 0 \end{cases}$



$a-1 < r$
 $a < r$
 $a > 0$
 $0 < a < r$

-3

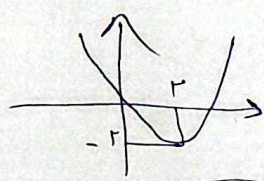
الف) $y = n^r + r$



$n = y^{\frac{1}{r}} + r$
 $n - r = y^{\frac{1}{r}}$
 $\sqrt[r]{n-r} = y$

-4

ب) $y = n^r - r$



یکدیگر نیست زیرا در یک تابع برای
 یک به یک بودن باید چند خطا بولاین باشد

-5

الف) $y = \frac{r^{m+1}}{m-r}$

$n = \frac{-ry-1}{r-y}$

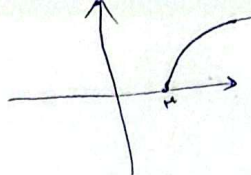
$f^{-1}(m) = \frac{-rm-1}{r-m}$

ب) $y = \frac{r+rn}{n+r}$

$n = \frac{r-ry}{r-y}$

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

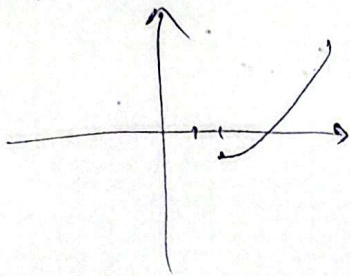
$$الف) y = \sqrt{n-r}$$



$$\begin{aligned} n &= \sqrt{y-r} \\ n^r &= y-r \\ y &= n^r + r \\ f^{-1}(n) &= n^r + r \end{aligned}$$

-9

$$\rightarrow y = n^r - r, n \in [r, +\infty)$$



$$\begin{aligned} y &= (n-r)^r - 1 \\ n-r &= \pm \sqrt[r]{y+1} \\ n &= r \pm \sqrt[r]{y+1} \\ f^{-1}(n) &= r + \sqrt[r]{n+1} \end{aligned}$$

-10

$$y = \frac{n}{\sqrt{n-r}} \quad \frac{n^r}{n^r-r} = \frac{n^r}{n^r-r} \rightarrow n, r, n^r - r, n^r = n^r n^r - r n^r \quad n, r = n^r \rightarrow n, r = n^r$$

$$n = \frac{y}{\sqrt{y-r}} \rightarrow n^r = \frac{y^r}{y^r-r} \rightarrow y^r n - r n^r = y^r = y^r n - y^r, r n^r$$

$$y^r = \frac{r n^r}{n^r-1} \rightarrow y = \sqrt[r]{\frac{r n^r}{n^r-1}} = \sqrt[r]{\frac{r n}{n^r-1}}$$

-11

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

$$f(n) = \sqrt[n-1]{} \rightarrow$$

$$g(n) = f(n) + \sqrt{f(n)} \rightarrow g^{-1}(n) = f(n) + \frac{1}{f} - \frac{1}{f} \sqrt{1+rf(n)} \rightarrow g^{-1}(n) = 1 + \sqrt{1+rf(n)}$$