

الف)  $f = \{(3, 2), (1, 0), (3, n^2 - n), (n, 2), (-1, 1)\}$

(1)

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

الف  $\rightarrow m = 3$

ب  $\rightarrow m = 2$

$n^2 - n = 2$

$n^2 - n - 2 = 0$

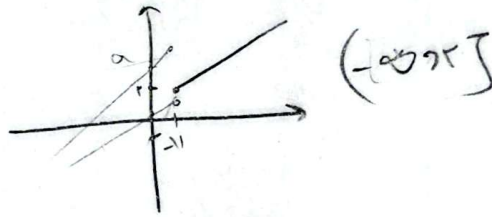
$(n-2)(n+1) \rightarrow 2 \checkmark$   
 $\rightarrow -1$

$n-1=1$   
 $\boxed{a = -1}$

$-1+2=1$

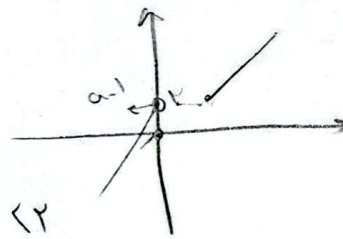
$(1, 2) \rightarrow n \boxed{= 2}$

$f(m) = \begin{cases} 3m-1 & ; m \geq 1 \\ n+a & ; m < 1 \end{cases}$



اگرچه (2)

$f(m) = \begin{cases} 3m-1 & ; m \geq 1 \\ an+a-1 & ; m \leq 0 \end{cases}$



$1 < a < 3$

(2)

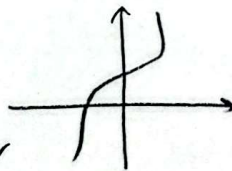
$-\infty < a < 3$

$\text{I} \rightarrow 1 < a < 3$

الف)  $y = x^2 + 2 \checkmark$

ب)  $x^2 - 2x + 2$

کمی بدبین



$x = y^2 + 2 \rightarrow y = \sqrt{x-2}$

(3)

الف)  $y = \frac{x+1}{x-2}$

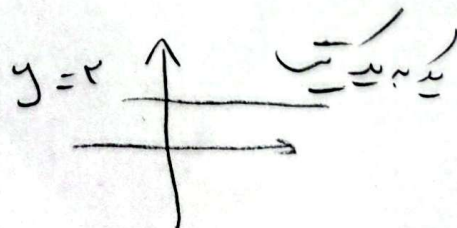
بدبین

$x = \frac{y+1}{y-1} \rightarrow y = \frac{x+1}{x-1}$

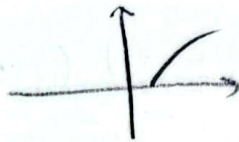
(4)

ب)  $y = \frac{1+2x}{x+2}$

$\frac{2(2+x)}{x+2}$

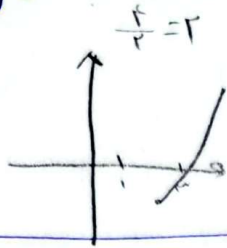


$$ii) y = \sqrt{x-r} \rightarrow$$



$$x = \sqrt{y-r} \rightarrow x^2 = y-r \rightarrow y = x^2 + r \quad (4)$$

$$v) y = x^2 - rx + r, \quad x \in [r, +\infty) \quad \checkmark$$



$$x = y^2 - ry + r \rightarrow x = (y-r)^2 - 1$$

$$(y-r)^2 = x+1 \rightarrow y = \sqrt{x+1} + r$$

$$x = y \cdot (y-r) \rightarrow x = y \cdot (y + \frac{1}{r} - \frac{1}{r}) = (y + \frac{1}{r})^2 - \frac{1}{r^2}$$

$$f(x) = x + \sqrt{x}$$

$$(0, \infty) \quad m + \frac{1}{r} = (ry + \frac{1}{r})^2$$

$$\sqrt{m + \frac{1}{r^2}} - \frac{1}{r} = ry \rightarrow y = m + \frac{1}{r} - \sqrt{m + \frac{1}{r^2}} = y \quad (\checkmark)$$

$$f^{-1}(x) = ax + b - \sqrt{x-c}$$

$$a + rb + rc = ?$$

$$a=1 \quad b=\frac{1}{r} \quad c=-\frac{1}{r^2} \\ a + rb + rc = 1$$

$$y = \frac{x}{\sqrt{x^2-r}} \rightarrow x = \frac{y}{\sqrt{y^2-r}} \rightarrow x^2 = \frac{y^2}{y^2-r} \rightarrow x^2 y^2 - ry = y^2 \quad (1)$$

$$\rightarrow x^2 y^2 - y^2 = rx^2 \rightarrow y^2 (x^2 - 1) = rx^2 \rightarrow y^2 = \frac{rx^2}{x^2 - 1}$$

$$y = \pm \sqrt{\frac{rx^2}{x^2-1}} \quad \checkmark$$

جواب درست  
y =

$$\frac{x_1^2}{x_1^2 - r} = \frac{x_2^2}{x_2^2 - r} \rightarrow x_1^2 x_2^2 - r x_1^2 = x_1^2 x_2^2 - r x_2^2 \rightarrow x_1^2 = x_2^2 \rightarrow x_1 = \pm x_2$$

جواب درست  
درست  
است

$$x_1 = x_2$$

$$\frac{a}{1+|a|} = f^{-1}(x)$$

$$f(-\frac{r}{\delta}) + g^{-1}(-\frac{r}{\delta} - 1)$$

$$g(x) = \sqrt{x-1}$$

$$\frac{f(x)}{g(x)}$$

جواب

$$x = \frac{y}{1+|y|}$$

$$x=1$$

$$g^{-1} \rightarrow x = \sqrt{y-1} \rightarrow (x+1)^2 = y$$

$$f(-\frac{r}{\delta}) = -\frac{r}{\delta} = \frac{y}{1+|y|} \xrightarrow{y < 0} -\frac{r}{\delta} = \frac{y}{1-y} \rightarrow -r + ry = \delta y \rightarrow y = \frac{-r}{\delta}$$

$$g(-\frac{r}{\delta}) \rightarrow (-\frac{r}{\delta} + 1)^2 = \frac{9}{r\delta} \rightarrow \frac{9}{r\delta} + (-\frac{r}{\delta}) = \frac{\sqrt{v-0}}{\sqrt{0}} = \frac{\sqrt{v}}{\sqrt{0}}$$



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

(10)

$$g(n) = f(n) + \sqrt[n]{f(n)}$$

$$g^{-1}(11) = ?$$

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

$$g = n^n + 1$$

$$g(n) = n^n + 1 + \sqrt[n]{n^n + 1}$$

$$g^{(1)}(11) + 1 + \sqrt[11]{g^{(1)}(11) + 1} = n$$

$$g^{-1}(11) = g^{(1)}(11) + \sqrt[11]{g^{(1)}(11) + 1} = 11$$

$$\rightarrow g = 11 \rightarrow g^{-1}(11) = \sqrt[11]{11}$$