

DATE / /

SUBJECT:

A. مرسى

11 نصف

19, 5

بجاء مرسى

$$f(x) = \begin{cases} x^2 - 4 & ; x > 2 \\ 11x - 10 & ; x \leq 2 \end{cases}$$

$$x^2 - 4 = 11x - 10$$

$$x^2 - 11x + 14 = 0$$

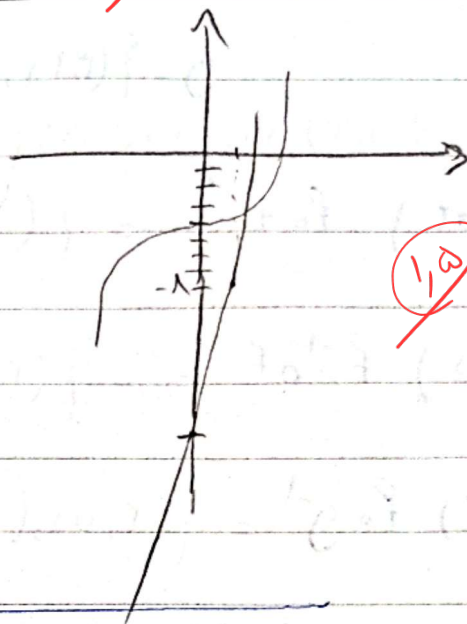
$$x(x - 11) = -14$$

$$x = 2, x = -2 \text{ غير ممكن}$$

$$\Rightarrow \boxed{2, 11}$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a \in [-1, +\infty)$$



$$f(x) = 11x + k \quad f^{-1}(2) = 2$$

$$\text{أي } f(x) =$$

$$y = 11x + k \rightarrow f^{-1}(x) \rightarrow x = 11y + k \rightarrow \frac{x - k}{11} = y \rightarrow \frac{x - k}{11} = 2 \rightarrow x - k = 22 \rightarrow k = -10$$

$$f(x) = 11x - 10 = 11 \times 2 - 10 = 12$$

$$b) f(f(x)) = f(11x - 10) = 11(11x - 10) - 10 = 121x - 110 - 10 = 121x - 120$$

$$A(x_0, a), \quad f(x) = \frac{ax}{x-1} \quad a = ?$$

$$f^{-1}(x) \rightarrow x = \frac{ay}{y-1} \rightarrow ay = xy - x \rightarrow ay - xy = -x \rightarrow y(a-x) = -x \rightarrow$$

$$y = \frac{x}{x-a} \xrightarrow{\substack{x=x_0 \\ y=a}} a = \frac{x_0}{a} \Rightarrow \boxed{a = x_0}$$

5 10

$$g = \{(r, r), (u, u), (v, v)\} \quad f = \{(r, u), (r, v), (v, r), (u, u)\} \quad \textcircled{2}$$

$$g^{-1} = \{(r, r), (u, u), (v, v)\} \quad / \quad f^{-1} = \{(u, r), (v, r), (r, v), (u, u)\}$$

ويعني $f \circ f^{-1} = \{(u, u), (v, v), (r, r), (u, u)\}$

$$ب) f^{-1} \circ f = \{(r, r), (r, r), (v, v), (u, u)\}$$

$$2) f \circ g^{-1} = \{(r, u), (u, u)\}$$

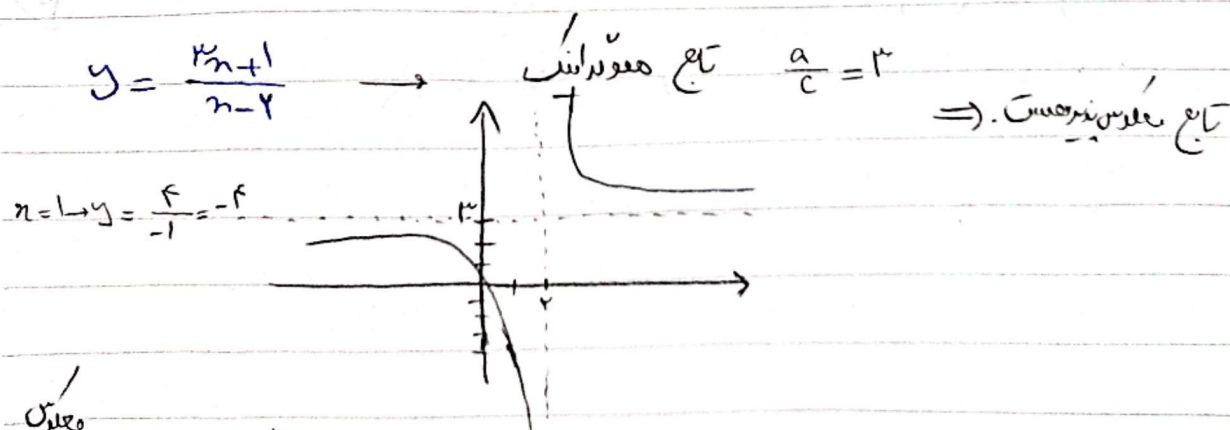
$$3) g^{-1} \circ f = \{(v, r), (u, u), (r, u)\}$$

$$h = \{(1, r), (r, r), (r, u), (u, u)\}, \quad g = \{(r, r), (r, u), (u, u)\}, \quad f = \{(r, r), (r, u), (u, u)\} \quad \textcircled{3}$$

$$g^{-1} = \{(r, r), (r, u), (u, u)\} \quad \text{أثبت أن} \quad \frac{h}{f \circ g^{-1}} \quad \text{دالة}$$

$$\frac{\{(1, r), (r, r), (r, u), (u, u)\}}{\{(r, r), (r, u), (u, u)\}} = \{(1, \frac{r}{r}), (r, \frac{r}{r}), (u, \frac{r}{r})\} \rightarrow$$

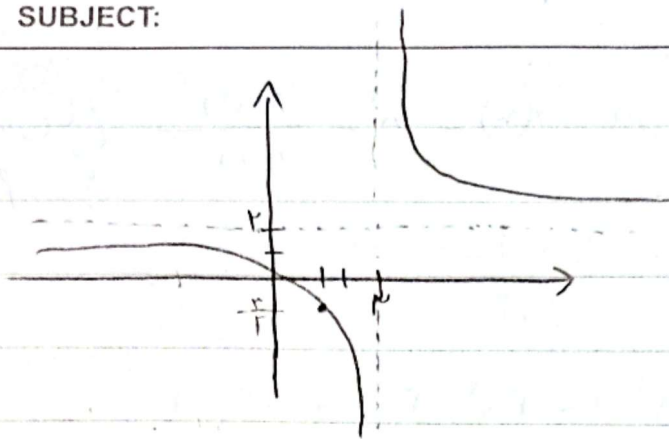
$$\frac{h}{f \circ g^{-1}} = \{(1, \frac{r}{r}), (r, \frac{r}{r})\}$$



$$n = \frac{r_{n+1}}{y-r} \rightarrow r_{n+1} = ny - r_n \rightarrow ny - r_n - r_{n+1} = 0$$

$$y(n-r) = \frac{r_{n+1}}{n-r} \rightarrow y = \frac{r_{n+1}}{n-r}$$

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



$$y = \frac{r_{n+1}}{n-r}$$

در این بازه $[a, b]$ داریم $f(n) = |n-1| - |n-r|$ ⑤
 در این بازه $[a, b]$ داریم $f(n) = |n-1| - |n-r|$ ⑤
 $a=1$ ⑤ $r=b$

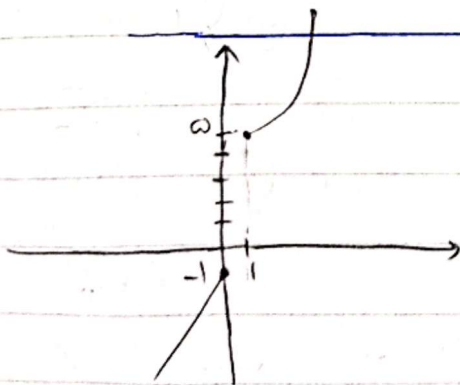
$$\begin{array}{ccc} -n+1+n-r = -r & n-1+n-r = 2n-r & n-1-n+r = r \\ \textcircled{-r} & & \textcircled{r} \end{array}$$

$$[a, b] = [1, r]$$

$$D_{f-1} = R_f$$

$$D_{f-1} = [-r, r]$$

$$y = \frac{r}{n-r} \xrightarrow{\text{ضرب}} n = ry - r \rightarrow \frac{n+r}{r} = y \rightarrow y = \frac{1}{r}n + 1$$



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

①

$$\begin{aligned} y = n^r + r & \rightarrow n = y^{\frac{1}{r}} + r \rightarrow y = \sqrt[r]{n-r} ; n \geq 1 \\ y = n^r - 1 & \rightarrow n = \sqrt[r]{y+1} \rightarrow y = \frac{n+1}{r} ; n < 1 \end{aligned}$$

Ex: $f^{-1}(n) = \frac{an+b}{k_n+d}$... $f(n) = n^r - \frac{(n+1)^r}{n+r}$... $f^{-1}(b)$... ⑨

وإذا $n = y^r - \frac{(y+1)^r}{y+r} \rightarrow \frac{y^r(y+r) - (y+1)^r}{y+r} = n$

$n(y+r) = y^{r+1} + ry^r - y^r - 1 - ry^r - ry = -ry - 1 \rightarrow$

$n = \frac{-ry-1}{y+r} \rightarrow ny + rn = -ry - 1 \rightarrow y(n+r) = -1 - rn \rightarrow y = \frac{-rn-1}{n+r}$
 $\frac{-rn-1}{n+r} = \frac{an+b}{k_n+d} = \frac{-4n-2}{k_n+4} \Rightarrow b = -2 \quad f^{-1}(-2) = \frac{4-1}{-2+3} = \boxed{3}$

? $f(n) = \frac{n}{n^r+1}$... f ... ⑩

$y = \frac{n}{n^r+1}$... $n = \frac{y}{y^r+1} \rightarrow y = ny^r + n - ny^r - ny = \dots$

$ny^r - y + n = \dots$

$y = \frac{+1 \pm \sqrt{1 - 4n^r}}{2n}$

$1 - 4n^r \geq 0 \rightarrow 1 \geq 4n^r$

$\frac{1}{4} \geq n^r$

$\frac{1}{4} \geq n$

$n = \left[-\frac{1}{4}, \frac{1}{4}\right]$

$y = \frac{1 + \sqrt{1 - 4n^r}}{2n}$