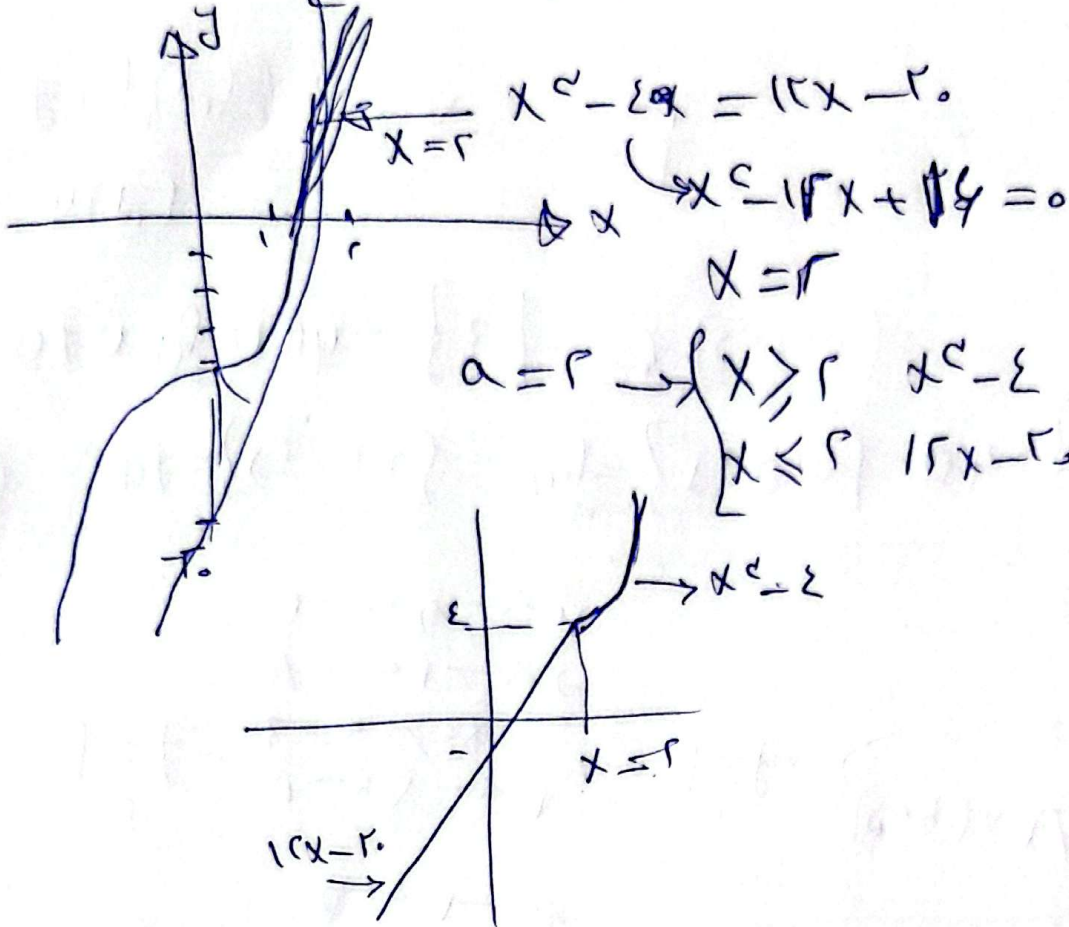


① $f(x) = \begin{cases} x^2 - 2 & x > a \\ 15x - 7 & x \leq a \end{cases}$



② $f(r) = 2 \rightarrow f(2) = 7 \rightarrow f(2) = 2x + k = 7$ ②
 $k = -1$

$f(x) = 2x - 1$

③ $f(r) = 21 - 1 = 20 \rightarrow f(r) = 20$

④ $f(x) = 2x - 1$

$f(f(x)) = 2(2x - 1) - 1 = 4x - 3 \rightarrow f(f(x)) = 4x - 3$

⑤ $A(r, a) \rightarrow A'(a, r)$ ⑤
 $f \text{ sub set}$
 $r a = \frac{a r}{a - 1}$
 $r a^2 - r a = a^2$
 $a^2 - r a = \begin{cases} a = x \\ a \leq r \end{cases}$

③

$$f \circ f^{-1}(x)$$

$$\begin{aligned} x &\rightarrow 0 \rightarrow x \\ y &\rightarrow 1 \rightarrow y \\ z &\rightarrow 2 \rightarrow z \\ w &\rightarrow 3 \rightarrow w \end{aligned} \rightarrow f \circ f^{-1}(x) = \{(x, x)\}$$

$$f \circ f(x)$$

$$\begin{aligned} x &\rightarrow 0 \rightarrow 0 \\ y &\rightarrow 1 \rightarrow 1 \\ z &\rightarrow 2 \rightarrow 2 \\ w &\rightarrow 3 \rightarrow 3 \end{aligned}$$

$$f \circ f(x) = \{(x, x), (y, y), (z, z), (w, w)\}$$

$$(2.) f \circ g^{-1}(x)$$

$$\begin{aligned} x &\rightarrow 0 \rightarrow 0 \\ y &\rightarrow 1 \rightarrow 1 \\ z &\rightarrow 2 \rightarrow 2 \\ w &\rightarrow 3 \rightarrow 3 \end{aligned} \rightarrow f \circ g^{-1}(x) = \{(x, x), (y, y), (z, z), (w, w)\}$$

$$g \circ f$$

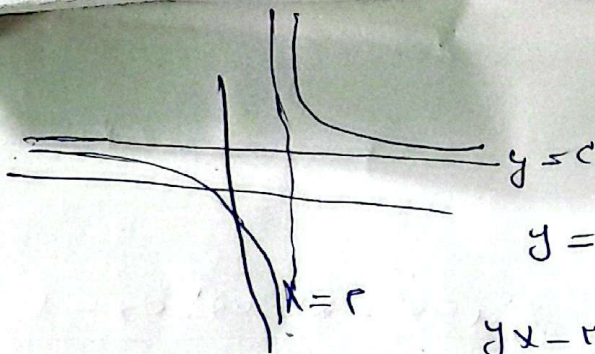
$$\begin{aligned} x &\rightarrow 0 \rightarrow 0 \\ y &\rightarrow 1 \rightarrow 1 \\ z &\rightarrow 2 \rightarrow 2 \\ w &\rightarrow 3 \rightarrow 3 \end{aligned}$$

$$g \circ f = \{(x, x), (y, y), (z, z), (w, w)\}$$

$$Df = \{(x, y, z)\} \quad Dg = \{(x, y, z)\} \quad Dh = \{(x, y, z)\}$$

$$Df \cap Dg \cap Dh = \{(x, y, z)\}$$

$$\frac{h(x)}{f(g(x))} = \frac{x}{N} = \frac{1}{N}$$



$$y = \frac{cx+1}{x-c}$$

$$yx - cy = cx + 1 \rightarrow yx - cx = c + 1$$

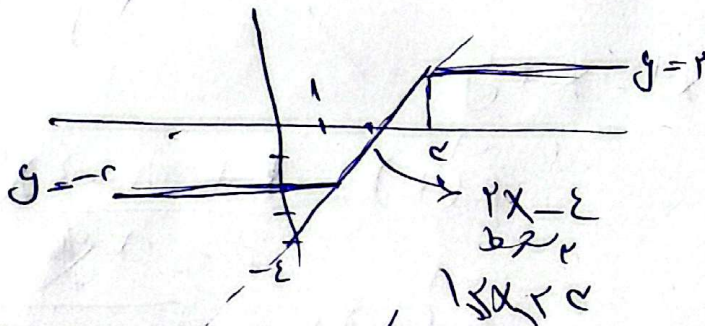
$$x(y-c) = c+1$$

$$f(x)^{-1} = \frac{1+cx}{x-c}$$

$$x = \frac{1+cy}{y-c}$$

②

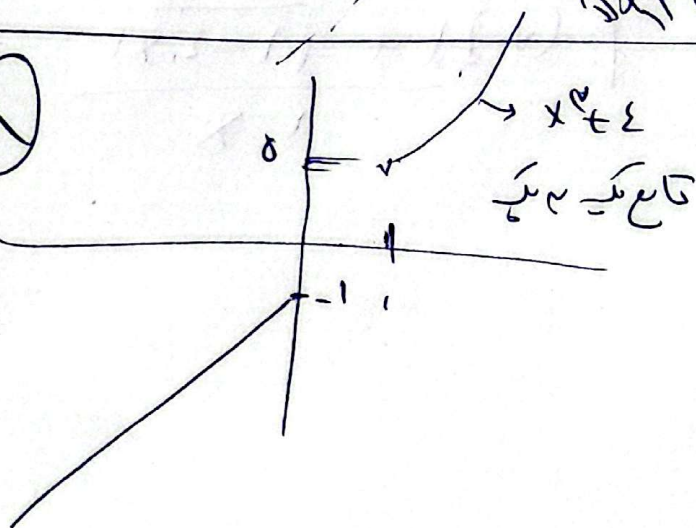
$-x+1$	$x-1$	$x-1$
$-x+c$	$-x+c$	$x-c$
$-r$	$rx-\varepsilon$	r



$$y = rx - r \rightarrow x = \frac{y+r}{r}$$

$$f(x) = \frac{x+r}{r}$$

③



$$f(x)^{-1} = \begin{cases} \sqrt{x-\varepsilon} & x \geq 0 \\ \frac{x+1}{\varepsilon} & x < -1 \end{cases}$$

④

$$y = \frac{x^r(x+c) - (x+1)^c}{(x+c)} = \frac{x^c + c/x^c - x^c - c/x^c - c x - 1}{x+c}$$

$$f(x) = \frac{-cx-1}{x+c}$$

$$y = \frac{-cx-1}{x+c} \rightarrow yx + cy = -cx - 1$$

$$y(y+c) = -cy - 1$$

$$f^{-1}(x) = \frac{-cx-1}{x+c} = \frac{-4x-1}{x+4} \rightarrow \begin{matrix} d=4 \\ b=-1 \\ a=-4 \end{matrix}$$

$$f^{-1}(x) = \frac{-4x-1}{x+4}, f(-c) = \frac{-4x-1-1}{x-1+4} = \frac{10}{5} = 2$$

$$f(b) = 0$$

① $f(x) = \frac{x}{x^r+1} \rightarrow yx^r + y = x$

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

$$yx^r - x + y = 0$$

$$0 \neq \rightarrow \mathbb{R}, R_{\frac{1}{r}} \leq y \leq \frac{1}{r}$$

$$\tilde{f}^{-1}(x) = \frac{x + \sqrt{1-4x^r}}{2x}$$

$$\tilde{f}^{-1}(x) \geq 1 + \frac{\sqrt{1-4x^r}}{2x}$$