

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس تاریخ

$$f(x) = \begin{cases} x^2 - 4 & ; x > a \\ 12x - 1 & ; x \leq a \end{cases}$$

$$a^2 - 4 \geq 12a - 1 \Rightarrow a^2 - 12a + 5 \geq 0 \Rightarrow a^2 - 12a + 4 \geq 0 \Rightarrow a(a - 12) + 4 \geq 0$$

$$\rightarrow (a + 4)(a - 12) \geq 0 \rightarrow a + 4 \leq 0 \vee a - 12 \geq 0 \rightarrow a \leq -4 \vee a \geq 12$$

پایه ها یک یک است

1,75

$$f(x) = 12x + 1 \xrightarrow{x=1} 12 + 1 = 13 \rightarrow 13 - 1 = 12 \rightarrow f(x) = 12x - 1$$

$$f^{-1}(x) = \frac{x+1}{12}$$

الف) $f(1) = 12 \cdot 1 - 1 = 11$

ب) $f(f(x)) = f(12x - 1) = 12(12x - 1) - 1 = 144x - 12 - 1 = 144x - 13$

5

د) $A(x, a) \rightarrow B(x, a)$

$$f(x) = \frac{ax}{x-1} \xrightarrow{x=a} \frac{a^2}{a-1} = 2a \Rightarrow 2a^2 - 2a = a^2 \Rightarrow a^2 - 2a = 0 \Rightarrow a(a-2) = 0$$

$a=0$ (X) $a=2$ (✓)

1,75

$f = \{(3,0), (4,1), (5,2), (6,3)\}$ $g = \{(3,1), (4,2), (5,3)\}$ $f^{-1} = \{(0,3), (1,4), (2,5), (3,6)\}$

الف) $f \circ f^{-1} = \{(0,0), (1,1), (2,2), (3,3)\}$ $g^{-1} = \{(1,3), (2,4), (3,5)\}$

ب) $f^{-1} \circ f = \{(3,3), (4,4), (5,5), (6,6)\}$

ج) $g \circ g^{-1} = \{(1,1), (2,2), (3,3)\}$

د) $g^{-1} \circ f = \{(3,1), (4,2), (5,3)\}$

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$f = \{(1,2), (2,1), (3,0)\}$ $g = \{(1,1), (2,2), (3,3)\}$ $h = \{(1,1), (2,2), (3,3)\}$

$h \circ g^{-1} = \{(1,1), (2,2), (3,3)\}$

$g^{-1} = \{(1,1), (2,2), (3,3)\}$

$h \circ g^{-1} = \{(1,1), (2,2), (3,3)\}$

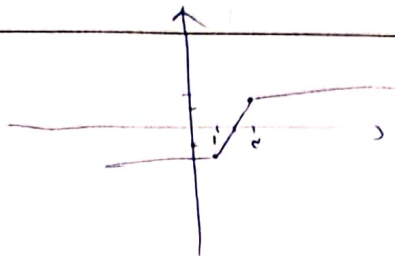
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$$f(x) = \frac{x+1}{x-1} \xrightarrow{\text{sub}} a = \frac{y+1}{y-1} \rightarrow ay - y = y + 1 \rightarrow y(x-1) = y + 1 \rightarrow y = \frac{y+1}{x-1} \text{ slope } \frac{1}{x-1}$$



$$f(x) = |x-1| - |x-c|$$

$$1-x+c \quad |x-1+c| \quad x-1-x+c = -1$$

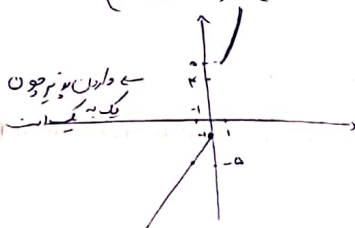


$$\rightarrow \text{slope } \frac{1}{x-1}$$

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

$$f(x) = \begin{cases} x^2+1 & ; x \geq 1 \\ x-1 & ; x < 1 \end{cases} \xrightarrow{\text{sub}} a = y^2+1 \rightarrow y = \sqrt{x-1}$$

$$\rightarrow f^{-1}(x) = \begin{cases} \sqrt{x-1} & ; x \geq 1 \\ \frac{x+1}{2} & ; x < 1 \end{cases}$$



$$f(x) = a - \frac{(x+1)^2}{x+1} = a - \frac{x^2+2x+1}{x+1} = a - \frac{x^2-1}{x+1} = a - \frac{(x-1)(x+1)}{x+1} = a - (x-1) = a - x + 1$$

$$f^{-1}(x) = \frac{ax+b}{cx+d} \rightarrow y = \frac{ax+b}{cx+d} \rightarrow y(cx+d) = ax+b \rightarrow ycx + yd = ax+b \rightarrow ycx - ax = b - yd \rightarrow x(yc - a) = b - yd \rightarrow x = \frac{b - yd}{yc - a}$$

$$\frac{ax+b}{cx+d} = \frac{-1-x}{x+1} \quad f^{-1}(x) = f^{-1}(-1) = \frac{-1-(-1)}{-1+1} = \frac{0}{0} = \text{undefined}$$

$$\begin{cases} a = -1 \\ b = -1 \\ c = 1 \\ d = 1 \end{cases} \rightarrow \frac{-1-x}{x+1} = \frac{x(-1-1)}{x(-1+1)} = \frac{-2x}{0} = \text{undefined}$$

$$f(x) = \frac{x}{x+1} \xrightarrow{\text{sub}} a = \frac{y}{y+1} \rightarrow xy + x + y = 0 \rightarrow xy + y = -x \rightarrow y(x+1) = -x \rightarrow y = \frac{-x}{x+1}$$

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