

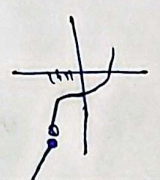
19, 175

نام و نام خانوادگی: کلاس: شماره: پاسنامه تشریحی تکلیف شماره:
نام برد مسکن: دانشه با سید

$$x^3 - 2 = 12x - 20 \xrightarrow{a} a^3 - 2 = 12a - 20$$

$$a^3 - 2 - 12a + 20 = 0 \rightarrow a^3 - 12a + 18 = 0 \rightarrow a(a^2 - 12) = -18$$

$$x^3 - 2, x > -2 \Rightarrow a = -2$$

$$12x - 20, x \leq -2 \Rightarrow a^2 - 12 \geq 12a - 20 \rightarrow a \in [-1, +\infty)$$


$$\begin{aligned} \gamma &\xrightarrow{f^{-1}} \varepsilon & f(\varepsilon) &= 12 + k & f(x) &= 12x - 10 \\ \varepsilon &\xrightarrow{f} \gamma & 12 + k &= \gamma & k &= -10 \end{aligned}$$

$$f(u) = 12 - 10 = 2$$

$$f(f(x)) = f(12x - 10) = 12(12x - 10) - 10$$

$$f(f(x)) = 144x - 130$$

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

$$y = \frac{x}{x-a}$$

$$\downarrow x = \frac{ay}{y-1} \Rightarrow f(a) = \frac{a}{a-a} = \infty \quad f(a) = a$$

$$a = 2$$

$$f^{-1} = \{(\omega, 3), (8, 4), (2, 1), (4, 9)\} \quad g^{-1} = \{(2, 3), (4, 1), (\omega, 9)\}$$

$$\omega \mid f \circ f^{-1} = \{(\omega, \omega), (1, 1), (2, 2), (4, 4)\} \quad \text{ج) } \{(2, \omega), (\omega, 2)\}$$

$$\text{ب) } f \circ f^{-1} = \{(3, 3), (4, 4), (1, 1), (2, 2)\} \quad \text{د) } \{(3, 9), (1, 3), (9, 1)\}$$

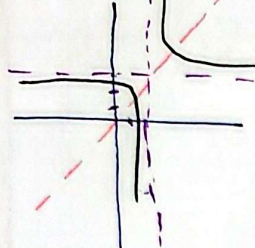
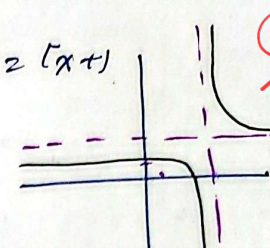
$$\begin{aligned} \gamma &\xrightarrow{g^{-1}} \varepsilon \xrightarrow{f} \omega \\ \varepsilon &\xrightarrow{f} \gamma \xrightarrow{g} x \\ \omega &\xrightarrow{g} \varepsilon \xrightarrow{f} \gamma \end{aligned}$$

$$\begin{aligned} \varepsilon &\xrightarrow{g} \omega \xrightarrow{f} \gamma \\ \gamma &\xrightarrow{f} \varepsilon \xrightarrow{g} x \\ \omega &\xrightarrow{g} \varepsilon \xrightarrow{f} \gamma \end{aligned}$$

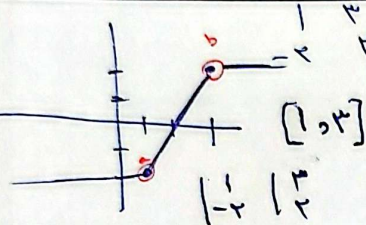
$$g^{-1} = \{(1, 2), (3, 4), (\omega, 1)\} \quad f \circ g^{-1} = \{(1, 4), (3, 1), (\omega, 3)\}$$

$$\frac{h}{f \circ g^{-1}} = \{(1, \frac{1}{2}), (3, \frac{1}{4}), (\omega, \frac{1}{3})\} \rightarrow \{(1, \frac{1}{2}), (3, \frac{1}{4})\}$$

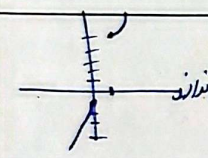
$x = \frac{y}{y+1} \rightarrow y = \frac{x}{x-1} \rightarrow xy - 1 = x \rightarrow xy - 1 - x = 0$
 $\Rightarrow xy - 1 - x = 0 \rightarrow y(x-1) = 1 \rightarrow y = \frac{1}{x-1}$
 $y = \frac{1}{x-1}$
 $x = \frac{y}{y+1}$

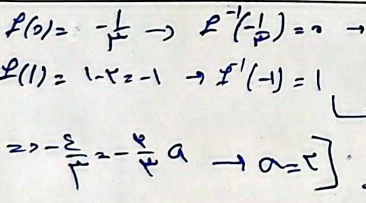
$\begin{cases} x = ay + b \\ x - 1 = ay + b \end{cases} \rightarrow \begin{cases} x = ay + b \\ x - 1 = ay + b \end{cases} \rightarrow \begin{cases} x = ay + b \\ x - 1 = ay + b \end{cases}$
 $\Rightarrow x = ay + b$
 $x - 1 = ay + b$
 $\Rightarrow x = ay + b + 1$
 $y = \frac{x-1}{a}$
 $x = a \cdot \frac{x-1}{a} + b + 1$
 $x = x - 1 + b + 1$
 $x = x$



$y = \frac{x-1}{a}$
 $x = a \cdot \frac{x-1}{a} + b + 1$
 $x = x - 1 + b + 1$
 $x = x$



$f(x) = \frac{x-1}{a} \rightarrow f^{-1}(x) = \frac{x+1}{a}$
 $f(1) = \frac{1-1}{a} = 0 \rightarrow f^{-1}(0) = 1$
 $\Rightarrow \frac{0+1}{a} = 1 \rightarrow a = 1$
 $f(x) = \frac{x-1}{1} = x-1$
 $f^{-1}(x) = \frac{x+1}{1} = x+1$



$y = \frac{x}{x+1} \rightarrow x = \frac{y}{y+1} \rightarrow xy + x = y \rightarrow xy + x - y = 0$
 $y = \frac{x}{x+1}$
 $x = \frac{y}{y+1}$

