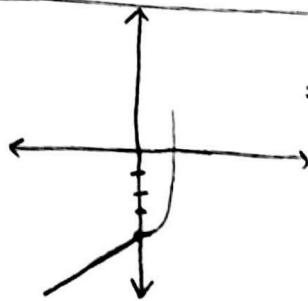
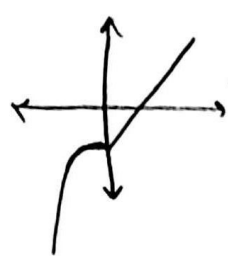


۱۷/۷۵



$$\Rightarrow \alpha = 0$$



در این حالت باید
α منفی باشد و در این
شرایط α مناسب و
مستمر بدست نمی آید

$$\alpha^2 = 12\alpha - 20$$

$$\alpha \in [-2, 10]$$

$$f(x_1) = 3x_1 + k \rightarrow \frac{f(x)}{x} = 3 + \frac{k}{x} \rightarrow k = -10$$

الف) $f(v) = (3 \times v) - 10 = 11$ ، $\rightarrow f(f(x_1)) = 3(3x_1 - 10) - 10 = 9x_1 - 40$

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

$$-a^2 + 2a = 0 \rightarrow a(-a+2) = 0 \rightarrow a = 2, 0 \rightarrow \text{غیر قابل قبول}$$

الف) $f(f^{-1}(x)) = x$ ، $f(f^{-1}(v)) = v$ ، $f(f^{-1}(2)) = 2$ ، $f(f^{-1}(4)) = 4 \rightarrow \{(1,1) (2,2) (3,3) (4,4)\}$

ب) $f^{-1}(f(3)) = 3$ ، $f^{-1}(f(4)) = 4$ ، $f^{-1}(f(v)) = v$ ، $f^{-1}(f(1)) = 1 \rightarrow \{(3,3) (4,4) (v,v) (1,1)\}$

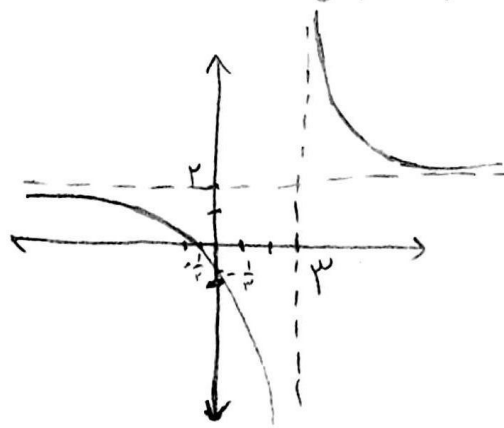
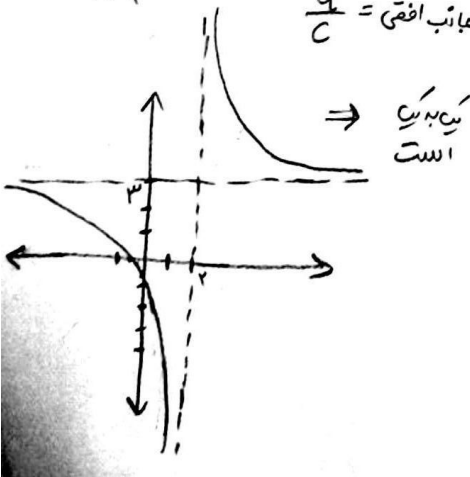
ج) $f(g^{-1}(2)) = x$ ، $f(g^{-1}(4)) = x$ ، $f(g^{-1}(x)) = 4 \rightarrow \{(2,x) (4,x) (x,4)\}$

د) $g^{-1}(f(3)) = 3$ ، $g^{-1}(f(4)) = x$ ، $g^{-1}(f(v)) = 3$ ، $g^{-1}(f(1)) = 1 \rightarrow \{(3,3) (v,3) (1,1)\}$

ه) $f(g^{-1}(1)) = 4$ ، $f(g^{-1}(3)) = 1$ ، $f(g^{-1}(x)) = 0 \rightarrow \{(1,4) (3,1) (x,0)\}$

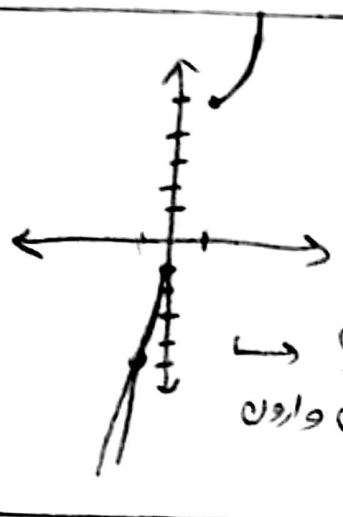
و) $\frac{h}{f \circ g^{-1}} \Rightarrow \{(1, \frac{2}{3}) (3, \frac{4}{3}) (x, \frac{1}{3})\}$

$$y = \frac{3x+1}{x-2} \rightarrow y(x-2) = 3x+1 \rightarrow yx - 2y = 3x+1 \rightarrow yx - 3x = 2y+1 \rightarrow x(y-3) = 2y+1 \rightarrow x = \frac{2y+1}{y-3}$$



م = ۲ = مماس قائم
ا = ۳ = مماس افقی

$$\begin{cases} y & : x > 1 \\ 2x - 1 & : 1 \leq x < 3 \\ -1 & : x < 1 \end{cases} \Rightarrow y = 2x - 1 \rightarrow x = \frac{y+1}{2} \xrightarrow{\text{تعويض}} y = \frac{y+1}{2}$$



$$\begin{cases} y = x^3 + 1 \rightarrow \sqrt[3]{y-1} = x \xrightarrow{\text{تعويض}} \sqrt[3]{x-1} = y \\ y = 2x - 1 \rightarrow \frac{y+1}{2} = x \rightarrow \frac{x+1}{2} = y \end{cases}$$

استعملت في كل واحد واحد

$$\frac{x^2(x+3) - (x+1)^3}{x+3} = \frac{-x^3-1}{x+3} = y \Rightarrow x = -\frac{\sqrt[3]{y+1}}{y+3} \xrightarrow{\text{تعويض}} y = \frac{(-\sqrt[3]{y+1})^2}{(-\sqrt[3]{y+1})+3} = \frac{-y^2-1}{-y+3} \Rightarrow f^{-1}(-1) = \frac{-1^2-1}{-1+3} = -1$$

$$y = \frac{x}{x+1} \rightarrow yx^2 - x + y = 0 \Rightarrow x = \frac{1 \pm \sqrt{1-4y^2}}{2y} \Rightarrow \Delta = 1 - 4(y)(y) = 1 - 4y^2$$

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