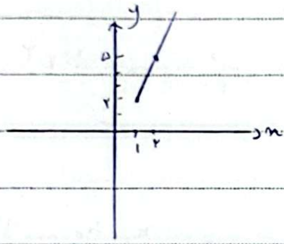
Subject:
Year: Month: Day:

page: ( )

۱- الف) $x^2-x=2 \to x^2-x-2=0 \to (x-2)(x+1)=0 \to x = 2 , -1$ غ ق ق $\to (-1,5)(-1,4)$ در این صورت تابع نداریم $\boxed{m=3}$

ب) $(2,3)(m,3) \to \boxed{m=2} \to m-1=2-1=\boxed{1} \to (-1,1)(a,1) \to \boxed{a=-1}$ ، $\frac{a}{-1}+2=1$ ، $(1,2)(1,x) \to \boxed{x=2}$

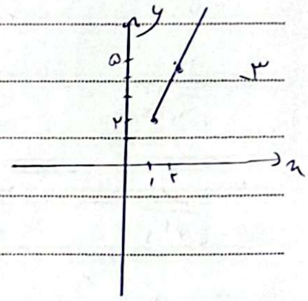
۲- $x=1 \to y=2$ ، $x=2 \to y=5$



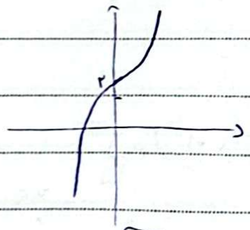
$\to a<2 \to \boxed{a=(-\infty,2)}$

۳- $\begin{cases} a>0 & ① \\ a-1<2 \to a<3 & ② \end{cases}$ ①∩② $\boxed{0<a<3}$

$x=1 \to 3x-1=2$ ، $x=2 \to 3x-1=5$

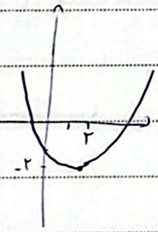


۴- الف)



$x=y^3+2 \to x-2=y^3 \to \boxed{y=\sqrt[3]{x-2}}$ → یک به یک است

ب) $\frac{-b}{2a}=\frac{4}{2}=\boxed{2}$ ، $y=4-8+2=\boxed{-2}$

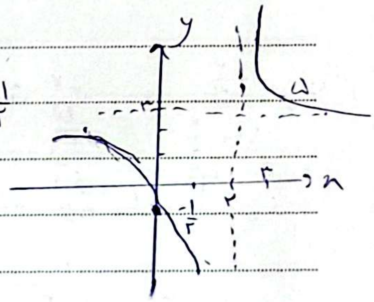


یک به یک نیست.

۵- الف) مجانب قائم $\Rightarrow x-3=0 \to \boxed{x=3}$ $(-2\times3 \neq 1)$ $\to x=0 \to y=-\frac{1}{3}$

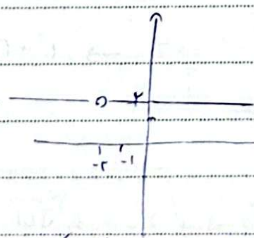
افقی $=\frac{3}{1}=\boxed{3}$

یک به یک است.



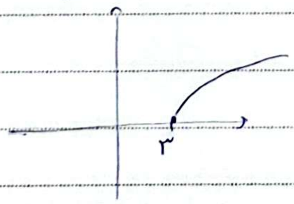
$x=-\frac{-3y-1}{y+3}=\frac{3y+1}{y+3}$

ب) $y=\frac{2(x+2)}{x+2}=2 \to x\neq -2$



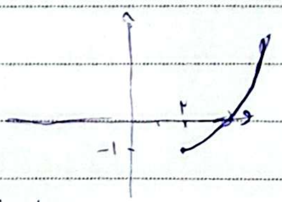
یک به یک نیست.

۶- الف)



یک به یک است. $x=\sqrt{y-3} \xrightarrow[x\geq 0]{\text{به توان ۲}} x^2=y-3 \to y=x^2+3$

ج) ext $\begin{cases} \frac{-b}{2a}=\frac{4}{2}=2 \\ 4-8+3=-1 \end{cases}$ ، $D_f=[2,+\infty)$



یک به یک است. $x=y^2-4y+3 \to y^2-4y+3-x=0 \to y=\frac{4\pm\sqrt{16-4(3-x)}}{2}$

Arman $\to R_{f^{-1}}=[2,+\infty)$ به همین دلیل و منفی نداریم ۲

$y=\frac{4\pm\sqrt{4(1+x)}}{2} \to y=2\pm\sqrt{1+x} \to y=2+\sqrt{1+x}$

۷- $x = y + \sqrt{y} \to \sqrt{y} = t \to x = t^2 + t \to t = \dfrac{-1 \pm \sqrt{1+4x}}{2}$

$y = \left(\dfrac{-1 \pm \sqrt{1+4x}}{2}\right)^2 = \dfrac{1 + 1 + 4x - 2\sqrt{1+4x}}{4} = \dfrac{2 + 4x - 2\sqrt{1+4x}}{4}$

$y = \dfrac{1}{2}x - \dfrac{\sqrt{1+4x}}{2} \to a = 1 \quad b = \dfrac{1}{2} \quad c = -\dfrac{1}{4} \Rightarrow 1 + 2\left(\dfrac{1}{2}\right) + 4\left(-\dfrac{1}{4}\right) = \boxed{1}$

۸- $\left.\begin{array}{l} y = \dfrac{x_1}{\sqrt{x_1^2 - 2}} \\ y = \dfrac{x_2}{\sqrt{x_2^2 - 2}} \end{array}\right\} \to \dfrac{x_1}{\sqrt{x_1^2-2}} = \dfrac{x_2}{\sqrt{x_2^2-2}} \Rightarrow x_1, x_2 \to$ هم علامت اند

همواره + $\to \sqrt{x_1^2 - 2} = \sqrt{x_2^2 - 2} \xrightarrow{\text{به توان ۲}} x_1^2 - 2 = x_2^2 - 2$

$\to x_1 = \pm x_2$ غ ق ق

$x = \dfrac{y}{\sqrt{y^2-2}} \xrightarrow{\text{به توان ۲}} x^2 = \dfrac{y^2}{y^2-2} \to y^2 = -\dfrac{-2x^2}{x^2+1} = \dfrac{2x^2}{x^2+1}$ تابع یک به یک نیست.

$\boxed{y = \pm\sqrt{\dfrac{2x^2}{x^2+1}}}$

۹- $g^{-1}\left(-\dfrac{2}{5}\right) \nearrow -\dfrac{2}{5} = \sqrt{x} - 1 \to \dfrac{3}{5} = \sqrt{x} \to x = \dfrac{9}{25} \to g^{-1}\left(-\dfrac{2}{5}\right) = \dfrac{9}{25}$

$f\left(-\dfrac{2}{5}\right) \to -\dfrac{2}{5} = \dfrac{x}{1+|x|} \to -2 - 2|x| = 5x \to x > 0 \Rightarrow -2 = 7x \to x = -\dfrac{2}{7}$ غ ق ق ($x < 0$)

$\quad \to x < 0 \to -2 = 3x \to x = -\dfrac{2}{3}$ ق ق

$f^{-1}\left(-\dfrac{2}{3}\right) = \dfrac{-\frac{2}{3}}{1 + \frac{2}{3}} = -\dfrac{2}{5}$ ق ق $\Rightarrow f\left(-\dfrac{2}{5}\right) + g^{-1}\left(-\dfrac{2}{5}\right) = \dfrac{9}{5} - \dfrac{2}{3} = \boxed{-\dfrac{23}{75}}$

۱۰- $y = \sqrt[3]{x-1} \xrightarrow{f(x)} x = \sqrt[3]{y-1} \to y - 1 = x^3 \to y = x^3 + 1 \to f(x) = x^3 + 1$

$g(x) = x^3 + 1 + \sqrt{x^3+1} \to \sqrt{x^3+1} = t \to t^2 + t - 12 = 0 \to (t-3)(t+4) = 0$

$12 \to t = 3 \to x^3 + 1 = 3^2 \to \boxed{x = \sqrt[3]{2}}$

$\to t = -4 \to x^3 + 1 = 4 \to x^3 = -5 \to \boxed{x = -\sqrt[3]{5}}$