نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ... کلاس .....

۱

الف) $h^2 - h = 2 \xrightarrow{-1} \times \rightarrow a \neq 4$

$h = 2$

$2 = 2 \Rightarrow m = 2$

ب) $2 = 2 \rightarrow m = 2$

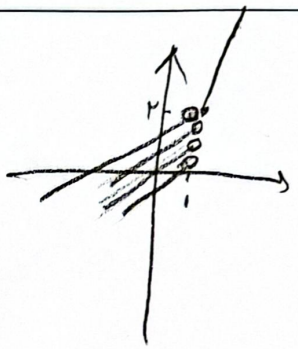
$(a, 1) \rightarrow a = -1$

$(1, h) \rightarrow h = 2$

۲

$a + 1 \leq 3 - 1 \rightarrow a \leq 1$

$(-\infty, 1]$



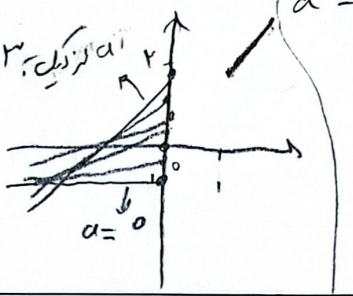
۳

$a - 1 \leq 2 - 1 \rightarrow a \leq 3$

$a > 0$

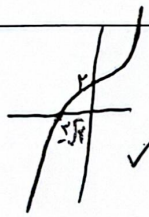
$0 < a \leq 3$

$(0, 3]$



۴

الف) $f: y = x^2 + 2$



$f^{-1}: x = y^2 + 2 \rightarrow y = \sqrt{x - 2}$

ب) $y = x^2 - 4x + 2$

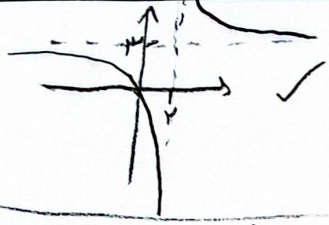
$\frac{-b}{2a} = 2 \rightarrow x = 2 \rightarrow y = -1$

$x = 1 \rightarrow y = -1$

یک به یک نیست

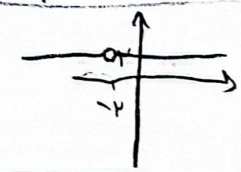
۵

الف) $f(x): y = \frac{2x + 1}{x - 2}$



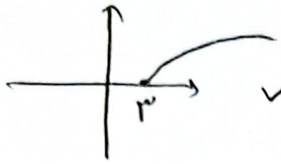
$f^{-1}(x): x = \frac{2y + 1}{y - 2} \rightarrow y = \frac{2x + 1}{x - 2}$

ب) $f(x): y = \frac{2x + 4}{x + 2} \rightarrow y = 2 \quad (x \neq -2)$



یک به یک نیست

الف) $f(x): y=\sqrt{x-3} \to$



✓ $\to f^{-1}(x): x=\sqrt{y-3} \Rightarrow y=x^2+3$
$(x\geq 0)$

ب) $f(x): y = x^2-4x+3$ ✓ ۶

$[2, +\infty)$ ، $\frac{-b}{2a}$

$f^{-1}(x): x=y^2-4y+3$

$y=\frac{4\pm\sqrt{16-12+4x}}{2} \Rightarrow y=2+\sqrt{x+1}$ ، $y\geq 2$

$f(x): y=x+\sqrt{x}$ ، $f^{-1}(x): x=y+\sqrt{y} \to (x-y)^2=y \to x^2-2xy+y^2-y=0$

$y^2-(2x+1)y+x^2=0 \to y=\frac{2x+1\pm\sqrt{(2x+1)^2-4x^2}}{2}$

$\frac{2x+1\pm\sqrt{4x+1}}{2} \to y = x+\frac{1}{2}-\sqrt{x+\frac{1}{4}} \to c=-\frac{1}{4}$ ، $a+2b+4c=1$ ۷

$x\geq 0 , y\geq 0$

$f(x): y=\frac{x}{\sqrt{x^2-2}}$ ، $\begin{cases}(x_1,y_1)\in f(x)\\(x_2,y_2)\in f(x)\end{cases} \xrightarrow{y_1=y_2} \frac{x_1}{\sqrt{x_1^2-2}}=\frac{x_2}{\sqrt{x_2^2-2}}$ (x_1, x_2 هم علامت)

$\Rightarrow \frac{x_1^2}{x_1^2-2}=\frac{x_2^2}{x_2^2-2}$ ، $x_1^2x_2^2-2x_1^2=x_1^2x_2^2-2x_2^2 \to 2x_1^2=2x_2^2$ (هم علامت) $x_1=x_2$ ✓ یک به یک است ۸

$f^{-1}(x): x=\frac{y}{\sqrt{y^2-2}} \to x^2=\frac{y^2}{y^2-2} \to y=\sqrt{\frac{2x^2}{x^2-1}}$

$f(-\frac{2}{5})=n \to f^{-1}(n)=-\frac{2}{5} \to \frac{n}{1-n}=-\frac{2}{5} \to 2n-2=5n$ ، $n<0$ ، $n=-\frac{2}{3}$

$g^{-1}(-\frac{2}{5})=m \to g(m)=-\frac{2}{5} \to \sqrt{m}-1=-\frac{2}{5} \to \sqrt{m}=\frac{3}{5} \to m=\frac{9}{25}$ ۹

$f(-\frac{2}{5})+g^{-1}(-\frac{2}{5})=\frac{9}{25}-\frac{2}{3}=-\frac{23}{75}$

$g^{-1}(12)=n \to g(n)=12$

$\underbrace{f(n)}_{t}+\sqrt{\underbrace{f(n)}_{t}}=12 \to (12-t)^2=t \to 144-24t+t^2=t$ ، 16 ✗ ۱۰

$\to t=\frac{25\pm\sqrt{625-576}}{2}=9$

$f(m)=9 \to f^{-1}(9)=m \to \sqrt[3]{8}=2$