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۱۹,۷۵

۱) $f=\{(3,2)(n,5)(3,n^2-n)(m,2)(-1,4)\} \to n^2-n=2 \to n^2-n-2=0 \Rightarrow (n-2)(n+1) \to$ $\boxed{n=2}$, $n=-1$ غ ق ق

$\boxed{m=3}$

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ب) $f=\{(-1,1)(4,2)(1,3)(\alpha,m-1)(\alpha+1,n)(m,3)\} \to m=2 \quad m-1=2-1=1 \quad a=-1$

$a+2=-1+2=1 \to \boxed{n=2}$

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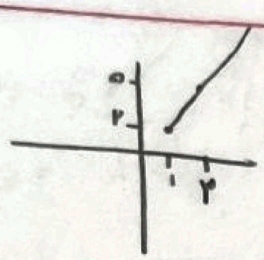
۲) $f(x)=\begin{cases}3x-1 & x\geq 1\\ x+a & x<1\end{cases}$

$3x-1 \to x=1 \to 2$

$3x-1 \to x=2 \to 5$



$\to x+a \leq 2 \to x=1 \to 1+a\leq 2 \to \boxed{a\leq 1}$

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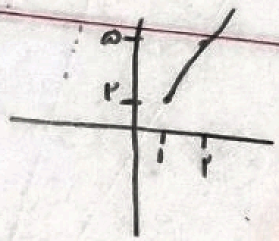
۳) $f(x)=\begin{cases}3x-1 & x\geq 1\\ ax+a-1 & x<0\end{cases}$

$3x-1 \to x=1 \to 2$

$3x-1 \to x=2 \to 5$



$x=0 \to a-1<2 \to \boxed{a<3}$

$a\in(0,3)$

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۴) الف) $y=x^3+2 \to$

$\to x=y^3+2 \Rightarrow x-2=y^3 \to \boxed{y=\sqrt[3]{x-2}}$

ب) $x^2-4x+2 \to \begin{cases}\frac{-b}{2a}=\frac{4}{2}=2\\ 4-8+2=-2\end{cases}$

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۵) $y=\frac{3x+1}{x-2} \to$ هموگرافیک $3x-2\neq 1 \to x=\frac{3y+1}{y-2} \to y=\frac{-(-2x-1)}{x-3}$ $\boxed{y=\frac{2x+1}{x-3}}$

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ب) $y=\frac{4+2x}{x+2}=\frac{2(2+x)}{x+2}=2 \to y=2$

الف) $y=\sqrt{x-3}$ $x-3\geq 0 \to x\geq 3$ (۶

$x=\sqrt{y-3} \to x^2=y-3 \to y=x^2+3$

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ب) $y=x^2-4x+3$ $\frac{-b}{2a}=\frac{4}{2}=2$, $4-8+3=-1$ $y=x^2-4x+3+1-1=(x-2)^2-1$

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

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

$f(x)=x+\sqrt{x} \to f(x)=t^2+t+\frac{1}{4}-\frac{1}{4} \to y=(t+\frac{1}{2})^2-\frac{1}{4} \Rightarrow y=(\sqrt{x}+\frac{1}{2})^2-\frac{1}{4}$

$x=(\sqrt{y}+\frac{1}{2})^2-\frac{1}{4}$ $\sqrt{y}=\sqrt{x+\frac{1}{4}}-\frac{1}{2} \to y=x+\frac{1}{4}+\frac{1}{4}-\sqrt{x+\frac{1}{4}} \to y=x+\frac{1}{2}-\sqrt{x+\frac{1}{4}}$ ص (۷

$a=1$
$b=\frac{1}{2}$ $a+2b+4c=1+1-1=1$
$c=-\frac{1}{4}$

$y=\frac{x}{\sqrt{x^2-2}}$ $f(x_1)=f(x_2)$ $\frac{x_1}{\sqrt{x_1^2-2}}=\frac{x_2}{\sqrt{x_2^2-2}} \to \frac{x_1^2}{x_1^2-2}=\frac{x_2^2}{x_2^2-2} \to x_1^2x_2^2-2x_1^2=x_1^2x_2^2-2x_2^2$

$x_1^2=x_2^2 \to x=\pm x_2 \to$ هم‌علامت‌اند $x \to \boxed{x_1=x_2}$ $\to x=\frac{y}{\sqrt{y^2-2}}$ $x^2=\frac{y^2}{y^2-2} \to x^2y^2-2x^2=y^2$ (۸

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

$f^{-1}(x)=\frac{x}{1+|x|}$ $g(x)=\sqrt{x}-1 \to \frac{x}{1+|x|}=-\frac{2}{5}=5x=-2-2|x| \to$ (۹

$5x+2x+2=0$ $\frac{-2}{3x+2} \ 7x+2 \to \boxed{x=-\frac{2}{3}}$ ص

$\sqrt{x}-1=-\frac{1}{5} \to \sqrt{x}=\frac{3}{5} \to x=\frac{9}{25}$ $\frac{-2}{3}+\frac{9}{25}=\frac{-50+27}{75}=-\frac{23}{75}$

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$f^{-1}(x) = \sqrt[3]{x-1}$ $g(x) = f(x) + \sqrt{f(x)}$

$y = \sqrt[3]{x-1} \rightarrow x = \sqrt[3]{y-1} \rightarrow x^3 = y-1 \rightarrow y = x^3+1$

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$g(x) = x^3+1 + \sqrt{x^3+1}$ $g^{-1}(x) = 12$

$\sqrt{x^3+1} = t \rightarrow t^2 - t = 12 \rightarrow t^2 + t - 12 = 0$ $(t+4)(t-3) = 0$ $t = -4$ غیرقابل قبول $t = 3$

$\sqrt{x^3+1} = 3 \rightarrow x^3+1 = 9 \rightarrow x^3 = 8 \rightarrow \boxed{x = 2}$