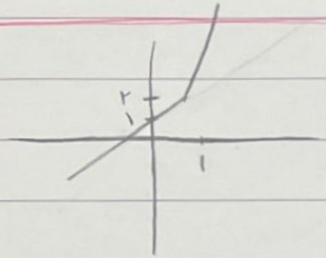
۱- الف) $(m,2)=(3,2) \rightarrow m=3$

$(3,2)=(3,n^2-n) \rightarrow n^2-n-2=0 \rightarrow (n-2)(n+1)=0 \rightarrow$ $\boxed{n=2}$ ، $n=-1 \rightarrow$ غ ق ق

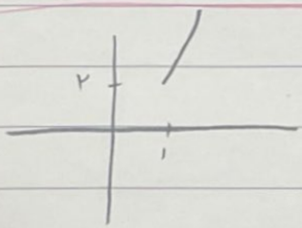
ب) $(m,3)=(2,3) \rightarrow m=2$

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

$(b,2)=(1,n) \rightarrow \boxed{n=2}$

۲- 

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

۳- 

$x=0 \rightarrow a-1 \leq 2 \rightarrow \boxed{a \leq 3}$

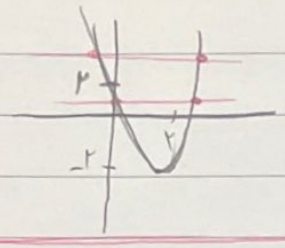
۴- الف) $y_1=y_2 \rightarrow x_1^3+2=x_2^3+2 \rightarrow \sqrt[3]{x_1^3}=\sqrt[3]{x_2^3} \rightarrow x_1=x_2$ تابع یک به یک است ✓

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

s.a.m

۴- $y = x^2 - 4x + 2 \rightarrow \frac{-b}{2a} = \frac{4}{2} = 2$

$y = 4 - 8 + 2 = -2$

ب) 

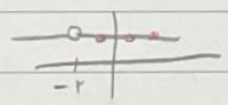
تابع یک‌به‌یک نیست ! ✗

۵- الف) $\frac{3x_1 + 1}{x_1 - 2} = \frac{3x_2 + 1}{x_2 - 2} \rightarrow 3x_1x_2 - 6x_1 + x_2 - 2 = 3x_1x_2 + x_1 - 6x_2 - 2$

$7x_2 = 7x_1 \rightarrow x_1 = x_2$ ✓ تابع یک‌به‌یک است

$\frac{3y+1}{y-2} = x \rightarrow y = \frac{2x+1}{x-3}$ معکوس

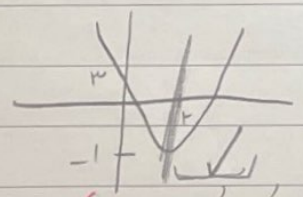
ب) $\frac{2(x+2)}{x+2} = 2 = y \rightarrow x \neq -2$



تابع یک‌به‌یک نیست ✗

۶- الف) $(\sqrt{x_1 - 3})^2 = (\sqrt{x_2 - 3})^2 \rightarrow x_1 - 3 = x_2 - 3 \rightarrow x_1 = x_2$ ✓ یک‌به‌یک است

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

ب) 

یک‌به‌یک است ✓

$x = (y^2 - 4y + 4 + 1) - 1$

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

$y = \sqrt{x+1} + 2$ معکوس

s.a.m

۷-

۸-

$$\frac{x_1}{\sqrt{x_1^2-2}} = \frac{x_2}{\sqrt{x_2^2-2}} \rightarrow \left(x_2\sqrt{x_1^2-2}\right)^2 = \left(x_1\sqrt{x_2^2-2}\right)^2$$

$$x_2^2\,(x_1^2-2) = x_1^2\,(x_2^2-2)$$

$$x_1^2x_2^2 - 2x_2^2 = x_1^2x_2^2 - 2x_1^2 \rightarrow -2x_1^2 = -2x_2^2$$

$$x_1^2 = x_2^2 \rightarrow x_1 = \pm x_2$$

یک به یک نیست ×

۹-

$$y = \frac{x}{1+|x|} \rightarrow x = \frac{y}{1+|y|} \rightarrow x + |y|x = y \rightarrow |y|(x-1) = -x$$

$$f(x) = |y| = \frac{-x}{x-1} \rightarrow$$

	0		1	
−		+		−

$-\frac{2}{5} \rightarrow \ominus$ قبول

$$g^{-1}(x) \Rightarrow \sqrt{y} - 1 = x \rightarrow (x+1)^2 = \sqrt{y} \quad (\;)^2$$

$$y = x^2+2x+1 = g^{-1}(x)$$

$$f\left(-\frac{2}{5}\right) = \frac{\frac{2}{5}}{-\frac{7}{5}} = -\frac{2}{7}$$

$$g^{-1}\left(-\frac{2}{5}\right) \rightarrow (x+1)^2 \rightarrow \left(1-\frac{2}{5}\right)^2 = \frac{9}{25}$$

$$\rightarrow \frac{9}{25} - \frac{2}{7} = \frac{63-50}{175} = \boxed{\frac{13}{175}}$$

$f(x) \Rightarrow \sqrt[3]{y-1} = x \xrightarrow{()^3} x^3 = y-1 \rightarrow y = x^3+1 = f(x)$ -1.

s.a.m