۱۹,۷۵ آفرین!

۱) رادمهر معتمدی   دوازدهم تجربی B   تکلیف: ۷

۲)

$$y=-\frac{1}{3}x^2+\frac{2}{5}x+1 \longrightarrow A\left|\begin{matrix}\frac{3}{5}\\ \frac{28}{25}\end{matrix}\right. \qquad B\left|\begin{matrix}4\\ 3\end{matrix}\right. \longrightarrow (B-A)\left|\begin{matrix}\frac{17}{5}\\ \frac{47}{25}\end{matrix}\right.$$

$$f(x) \longrightarrow f(\underbrace{x-\frac{17}{5}}_{t})+\frac{47}{25}=0 \longrightarrow -\frac{1}{3}t^2+\frac{2}{5}t+1+\frac{47}{25}$$

$$\xrightarrow{\times(-75)} 25t^2-30t-216=(5t+12)(5t-18)=0 \rightarrow t=\frac{18}{5}, -\frac{12}{5} \longrightarrow x=\frac{35}{5}, \frac{5}{5}$$

$$x_1=7,\ x_2=1$$

۲) $f(x)=a(x-3)(x+1) \to f(1)=4 \to -4a=4 \to a=-1 \to f(x)=-(x-3)(x+1)$
با استفاده از شکل

$1-2f(3x+2)=1+2\underbrace{(3x-1)(3x+3)}_{9x^2+6x-3}=18x^2+12x-5 \to$ ریشه‌ها $\left|\begin{matrix}-\frac{1}{3}\\ -7\end{matrix}\right. \to \alpha\beta=\frac{7}{3}$ ۲

۳) $3\sqrt{2x} \longrightarrow 3-\sqrt{2x+2} \longrightarrow \sqrt{2x+2}-3 \longrightarrow \sqrt{2x+2}+2=\frac{7}{2} \to x=\frac{1}{8}$ ۲

۴) ۱,۷۵

$x-1\in D_f \Rightarrow a<x-1\le 4 \to a+1<x\le 5$
$x+1\in D_g \Rightarrow -1\le x+1\le b \to -2\le x<b-1$
$\Big\}\ -2<x<5=D_f\cap D_g$

$5\notin D_f\cap D_g \wedge (5\in D_f) \Rightarrow 5\notin D_g \to b-1=5 \to b=6$
$-2\notin D_f\cap D_g \wedge (-2\in D_g) \Rightarrow -2\notin D_f \to a+1=-2 \to \cancel{a=-2}$
$\Big\}\ a-b=\cancel{-8}\ -9$

دقت کن $a=-3$

۵) ۲

$\sqrt{|2f(x)-3|} \longrightarrow \cancel{4}\ |2f(x)-3| \to x\in D_f$: نمودار : $-3\le x\le 5 \to -\frac{1}{2}\le\frac{x}{2}+1\le\frac{7}{2}$

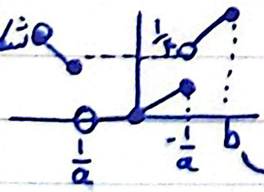
$f(\frac{x}{2}+1)\in[-1,3] \Rightarrow R_f=[-1,3] \to \sqrt{\cancel{4}\,|2f-3|}$, $x\in[\cancel{-\frac{1}{2}},\frac{7}{2}]$ $\longrightarrow -1\le y\le 3 \to -2\le 2y\le 6$

$-5\le 2y\cancel{6}-3\le 3 \longrightarrow |2y-3|\le 5 \to \sqrt{|2y-3|}\le\sqrt{5} \to [0,\sqrt{5}]$

۶) ۲

$y=\frac{x}{a}[ax]$ ~~[illegible]~~ $f(x)=x[x] \to y=\frac{1}{a^2}f(ax)$

براساس شکل x $\longrightarrow$ $f(x)=0 \longrightarrow 0\le x<1 \longrightarrow y=0 \to 0\le ax<1$
منفی بوده پس ~~[illegible]~~ a نیز منفی است : $a<0$

شکل 

$\cancel{4}\ y=\frac{1}{4}=\frac{1}{a^2}f(ax)=\frac{1}{a^2}f(a\times\frac{1}{a}) \to \left.\begin{matrix}a^2=4\\ a<0\end{matrix}\right\}a=-2$

$b=\frac{-2}{a} \to b=1 \longrightarrow b-a=3$

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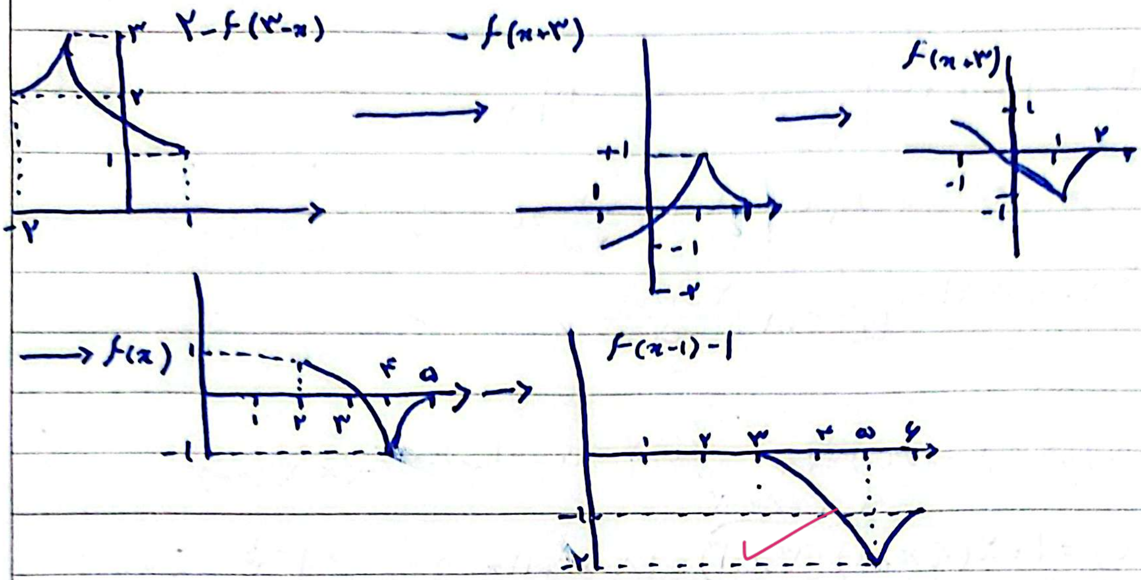

۸) ۲

۹) ۲

$$g(x)=f(x-2)+1=\left|\frac{x-2+1}{2(x-2)+1}\right|+1=\left|\frac{x-1}{2x-3}\right|+1\to g(x)\geq 1$$

$$0\geq x+g(x)\geq x+1\to x\leq -1\to \underset{x\leq -1}{g(x)}=+\frac{x-1}{2x-3}+1=\frac{2x-3+x-1}{2x-3}=\frac{3x-4}{2x-3}$$

$$\underset{x\leq -1}{x+g(x)}=x+\frac{3x-4}{2x-3}=\frac{2x^2-3x+3x-4}{2x-3}=\frac{2x^2-4}{2x-3}<0\to 2x^2-4>0\to x^2>2\to x<-\sqrt{2}$$

$$x\leq -1\to 2x-3\leq 0$$

۷) ۲

$$f(x)=\log_{2} x\to f(x+2)\to -f(x+2)\to 3-f(x+2)\to -f(x+2)+3=g(x)$$

$$g(-14)=-f(+14+2)+3=-1\ ,\ g(-62)=-f(62+2)+3=-3\to -1-3=-4$$

۱۰) ۲

$$f(x)=a(x+b)^3+c\to f(0)=0,\ f(2)=27$$

$$\to ab^3+c=0,\ a(b+2)^3+c=27\to f(x)=\frac{27}{8}(x-2)^3+27$$

$$g(x)=\sqrt{28f(x)-f(x)^2}\to 0\leq f(x)\leq 28\to -27\leq\frac{27}{8}(x-2)^3\leq 1\Rightarrow -3\leq\frac{3}{2}(x-2)\leq 1$$

$$-2\leq x-2\leq\frac{2}{3}\to 0\leq x\leq 2.\bar{6}\to x=0,1,2$$ ، ۳ عدد صحیح