حسین شیرازی ۱۴,۷۵

۱-

$y=-\frac{1}{3}x^2+\frac{2}{5}x+1$ $\quad -\frac{1}{3}\left(\frac{9}{25}\right)+\frac{6}{25}+1 = \frac{25}{25}+\frac{3}{25}=\frac{28}{25}$

$x_s=\frac{-b}{2a} = \frac{-\frac{2}{5}}{-\frac{2}{3}} = \frac{3}{5}$ $\quad y=-\frac{1}{3}\left(x-\frac{3}{5}\right)^2+\frac{28}{25}$

$y=-\frac{1}{3}(x-4)^2+3$

$-\frac{1}{3}(x-4)^2+3=0 \quad (x-4)^2=9 \quad x=4\pm3$

$\boxed{x=1}$ ✓

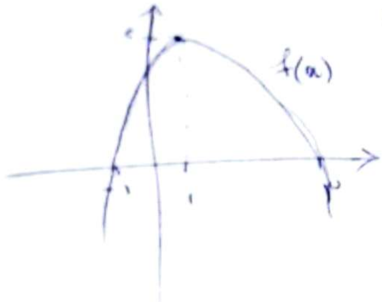
$\boxed{x=7}$

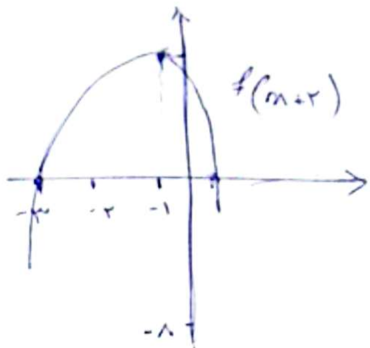
۲

۲-

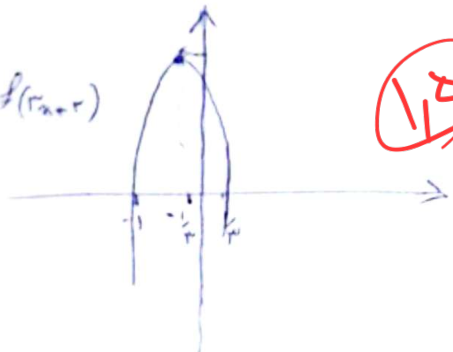
$y=1-2f(3x+3) \longrightarrow -2f(3x+3)+1$

③ ② ① ④





$\alpha\cdot\beta=\frac{7}{3}$



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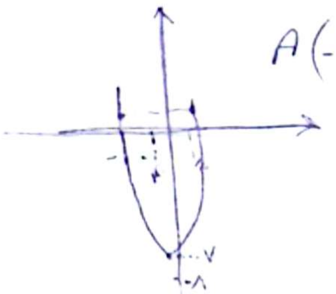


$A\left(-\frac{1}{3},-7\right)$ ✓

۳-

$y=3-\sqrt{2x}$ $\quad y=\sqrt{2x+2}+\cancel{k}$ $\quad \sqrt{2x+2}+\cancel{k}=\frac{7}{2}$

$3-\sqrt{2(x+1)} \longrightarrow -3+\sqrt{2x+2}+6$

$\sqrt{2x+2}=\frac{7}{2}-2=\frac{3}{2}$

$\boxed{x=\frac{1}{8}}$ ✓

$2x+2=\frac{9}{4}$ $\quad 2x=\frac{1}{4}$

$2x=\frac{9}{4}-\frac{8}{4}$ $\quad x=\frac{1}{8}$

۲

~~$D_f = [a, 4]$~~

~~$D_g = [-1, b)$~~

-۴

$-2 < x < 5$

$D_{f(x-1)} \cap D_{g(x+1)} = (-2, 5)$

$D_f = a \le x \le 4$

$a \le x - 1 \le 4 \to a+1 \le x \le 5$

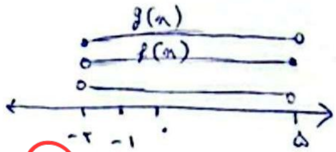
$-1 \le x+1 < b \quad -2 \le x < b-1$

$b - 1 = 5$

$b = 6$

$a + 1 = -2 \quad a = -3$

$a - b = -3 - (6) = -9$ ✓



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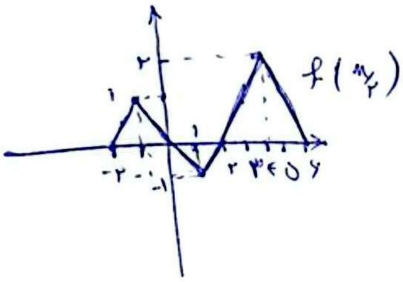
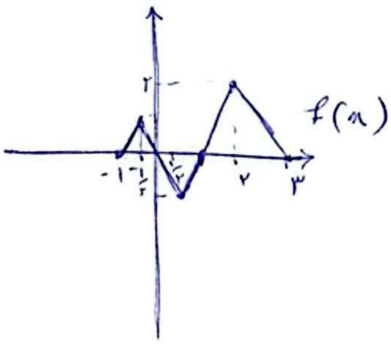
-۵

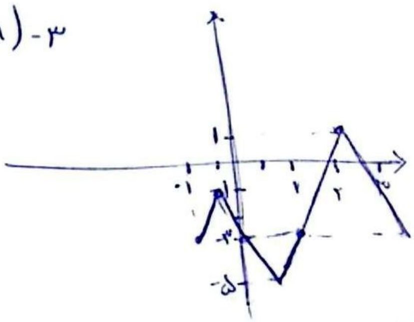


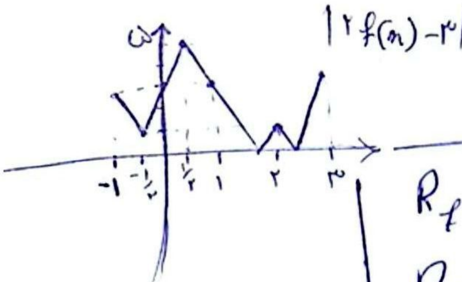


$D_f = [-\frac{1}{2}, \frac{7}{2}]$

$R_f = [0, \sqrt{5}]$

$= 2f(x) - 3$





$R_f = [0, 5]$

$D_f = [-1, 3]$

$\sqrt{|2f(x)-3|} \to |2(f(x)-3| \ge 0$

۱

$y = \frac{x}{a}[ax]$

$f(-\frac{1}{a}) = \frac{1}{4} \to -\frac{1}{a}[-1] = \frac{1}{4} \to a^2 = 4 \to \begin{cases} a = 2 & \times \\ a = -2 & \checkmark \end{cases}$

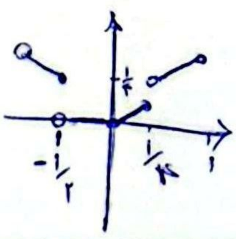
$a = 4$

$|1 - 4| = -3|$

$y = \frac{x}{4}[4x]$

$b = 1$

$b - a = 3$



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-۷

$f(x)=\log_{۲}^{x} \longrightarrow \log_{۲}^{x+۲} \longrightarrow -\log_{۲}^{x+۲} \longrightarrow -\log_{۲}^{-x+۲}+۳$

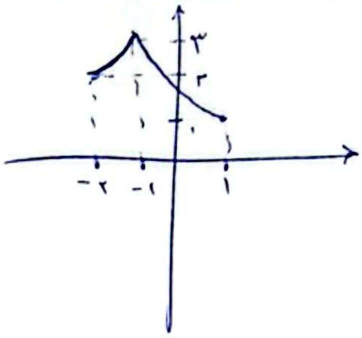
$g(x)=-\log_{۲}^{-x+۲}+۳$ $\quad g(-۱۴)+g(-۶۲)=\cancel{-\log_{۲}^{-(-۱۴)+۲}}+۳-\log_{۲}^{-(-۶۲)+۲}+۳=$ ۲

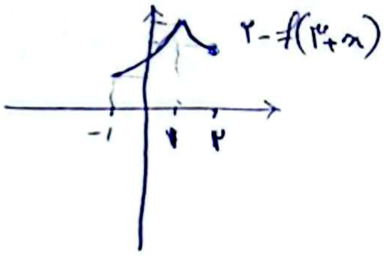
$\boxed{-۴+۳-۶+۳=-۴}$

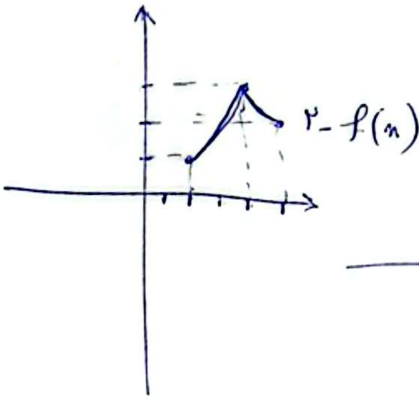
-۸

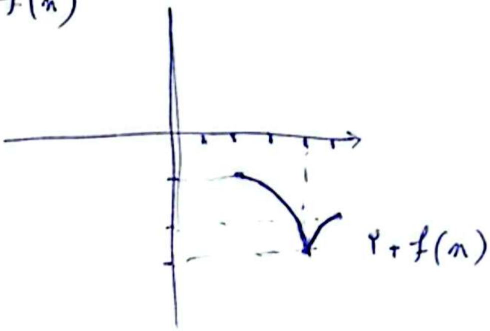
$y=۲-f(۳-x)$ $\quad -۲\leq ۳-x\leq ۱$ $\quad -۵\leq -x\leq -۲$ $\quad ۲\leq x\leq ۵$

$y_{۲}=f(x-۱)-۱$









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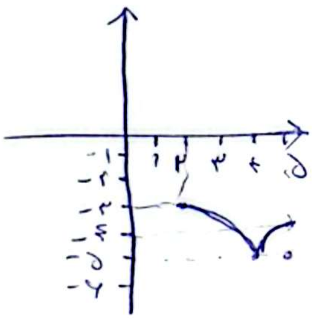

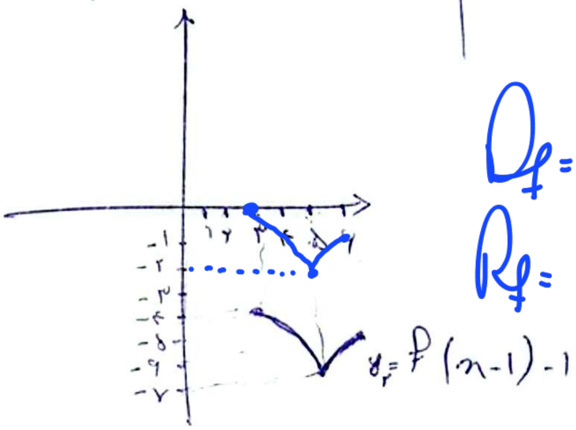

$D_f=[۳,۶]$

$R_f=[-۲,۰]$

$f(x)=\left|\frac{x+۱}{۲x+۱}\right|$ $\quad \left|\frac{(x-۲)+۱}{۲(x-۲)+۱}+۱\right| \Rightarrow \left|\frac{x-۱}{۲x-۳}+۱\right|$

$\frac{-۳x+۴}{۲x-۳}<x$

$-۳x+۴<۲x^۲-۳x$

$-۲x^۲+۴<۰$

$-۲(x^۲-۲)<۰$ $\quad -\sqrt{۲} \quad \sqrt{۲}$ $\quad + \mid - \mid +$

$\left|\frac{x-۱+۲x-۳}{۲x-۳}\right|=\left|\frac{۳x-۴}{۲x-۳}\right|$ $\quad \left|\frac{۳x-۴}{۲x-۳}\right|<-x$

$\frac{۳x-۴}{۲x-۳}<x$

$۳x-۴<۲x^۲-۳x$

$-۲x^۲+۶x-۴<۰$ $\quad ۱ \quad ۲$ $\quad + \mid - \mid +$

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$-۲x^۲+۴<۰ \qquad -۲(x^۲-۲)<۰ \qquad x^۲-۲>۰$

$(x-\sqrt{۲})(x+\sqrt{۲})>۰$

	$-\sqrt{۲}$		$\sqrt{۲}$	
+		−		+

$-۲x^۲+۶x-۴<۰ \qquad (x-۲)(x-۱)<۰$

	۱		۲	
+		−		+

$\cap$

اشتراک $(\sqrt{۲}, ۲)$

$(۱,\cancel{۲})\cap(-\infty,-\sqrt{۲})\cup(\sqrt{۲},\cancel{+\infty}) = \boxed{(\sqrt{۲},۲)}$

۱۰.

$f(x)$

$g(x)=\sqrt{۲۸f(x)-f^۲(x)} \qquad f(x)(۲۸-f(x))\geq ۰$

	۰		۲۸	
−		+		−

$D_{g(x)}=[۰,۲۸] \to ...$

~~f(x)~~ ~~f(x)~~ $۰\leq f(x)\leq ۲۸$

$۰\leq x<۳$

$D_g=[۰,۳)$ $[۰,\frac{۸}{۳}]$

$D_g \mid x\in \mathbb{Z} = \{۰,۱,۲\}$

۱٫۷۵