نگار حیدری — بسم الله الرحمن الرحیم — تمرین شماره (۷)

سوال ①

$$f(x) \Rightarrow S\left(\frac{3}{5}, \frac{28}{25}\right) \xrightarrow{\text{منتقل}} (4, 3) \Rightarrow f\left(x - \frac{17}{5}\right) + \frac{47}{25}$$

$$4 - \frac{3}{5} = \frac{17}{5}$$

$$3 - \frac{28}{25} = \frac{47}{25}$$

$$\xrightarrow{\text{ضابطه } f(x)} \frac{1}{3}x^2 + \frac{8}{3}x - \frac{7}{3} \rightarrow 0$$

$$x^2 - 8x + 7 = 0 \longrightarrow \begin{cases} x = 1 \\ x = 7 \end{cases}$$

سوال ②

$$y = 1 - 2f(3x + 2) \rightarrow S' = (\alpha, \beta) \xleftarrow{\text{منتقل}} S(1, 4)$$

راس سهمی

$$\rightarrow 3\alpha + 2 = 1 \longrightarrow 3\alpha = -1 \Rightarrow \alpha = -\frac{1}{3}$$

$$\beta = 1 - 2(4) = -7 \qquad \alpha\beta = -\frac{1}{3} \times -7 = \boxed{\frac{7}{3}}$$

سوال ③

$$y = 3 - \sqrt{2x} \xrightarrow{\leftarrow 1} 3 - \sqrt{2(x+1)} \longrightarrow \sqrt{2x+2} - 3$$

$$\xrightarrow{\uparrow 5} \sqrt{2x+2} - 3 + 5 \Rightarrow y' = \sqrt{2x+2} + 2 = \frac{7}{2}$$

$$\sqrt{2x+2} = \frac{3}{2} \Rightarrow 2x + 2 = \frac{9}{4} \Rightarrow 2x = \frac{1}{4}$$

$$\boxed{x = \frac{1}{8}}$$

سوال ۴

$Df = (\alpha, ٤] \to \alpha \leq x-1 \leq ٤ \Rightarrow \alpha+1 \leq x \leq ٥$

$Df(x-1) = (\alpha+1, ٥]$

$Dg = [-1, b) \to -1 \leq x+1 \leq b \Rightarrow -٢ \leq x < b-1 \to Dg_{(x+1)} [-٢, b-1)$

$Df+g \Rightarrow Df \cap Dg \Rightarrow (\alpha+1, ٥] \cap [-٢, b-1) = (-٢, ٥)$

$\to \alpha+1 = -٢ \Rightarrow \alpha = -٣$

$\to b-1 = ٥ \to b = ٦$

$\alpha - b = -٣ - ٦ = \boxed{-٩}$

سوال ۵

$f(\frac{x}{٢}+1) \to [-٣, ٥] \to Df = [\frac{-٣}{٢}+1, \frac{٥}{٢}+1]$

$\Rightarrow Df = [-\frac{1}{٢}, \frac{٧}{٢}] \to$ دامنه هم همین تغییر می‌کند

$y_٢ = \sqrt{|٢f(x)-٣|} \to \min_R = ٠$

$\max_{R \xrightarrow{(-1)}} \sqrt{٥}$

$\boxed{Rf = [٠, \sqrt{٥}]}$

سوال ۷

$\log_٢ x \to \log_٢ (x+٢) \to -\log_٢ (x+٢) \to$

$-\log_٢ (-x+٢) \to -\log_٢ (-x+٢) + ٣ \Rightarrow g(x)$

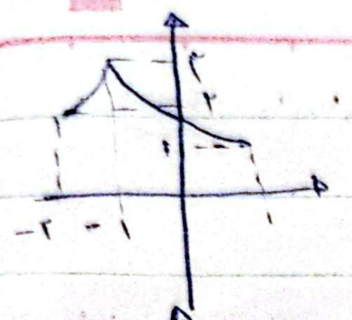
$g(-1٤) = -\log_٢ (-(-1٤)+٢) + ٣ = -\log_٢ 1٦ + ٣ = -٤+٣ = -1$

$g(-٦٢) = -\log_٢ (-(-٦٢)+٢) + ٣ = -\log_٢ ٦٤ + ٣ = -٦+٣ = -٣$

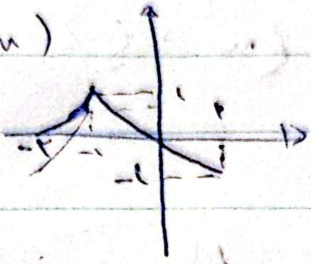
$g(-1٤)+g(-٦٢) \Rightarrow -٣-1 = \boxed{-٤}$

طرح

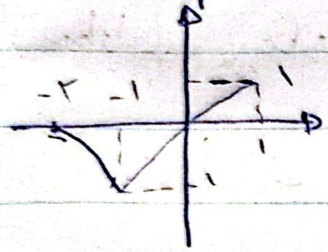
سوال ۳



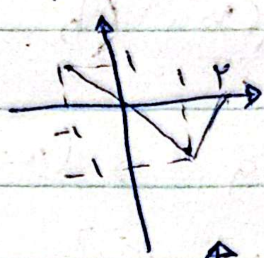
$2 - f(2-x)$



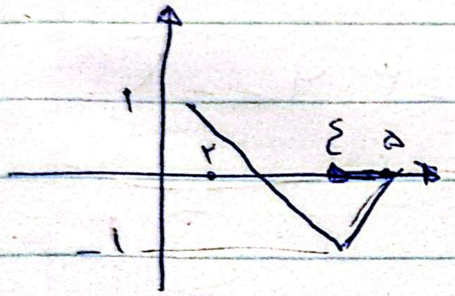
$-f(3-x)$



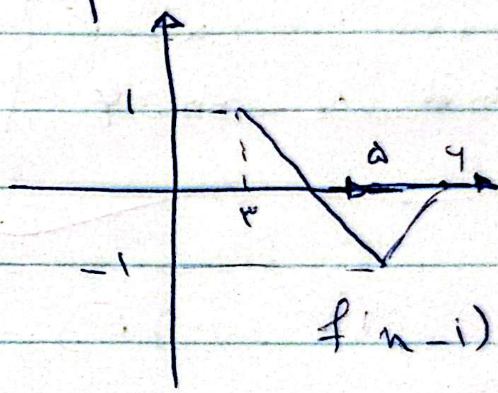
$f(2-x)$



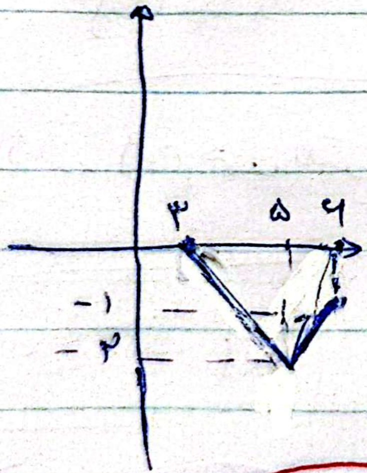
$f(2+x)$



$f(x)$



$f(x-1)$



$-f(x-1)-1$

سوال ۴

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

$$\frac{1}{x}+\left|\frac{x-1}{2x-3}\right|+1<0$$

	0		1		$\frac{3}{2}$	
$+$		$+$		$-$		$+$

همواره مثبت $\Longrightarrow x<0 \longrightarrow$ مجهولی کن

روشن است $\left|\frac{x-1}{2x-3}\right|+1$

$$\frac{2x^2-3x+x-1+2x-3}{2x-3} < 0 \Rightarrow \frac{2x^2-4}{2x-3} < 0$$

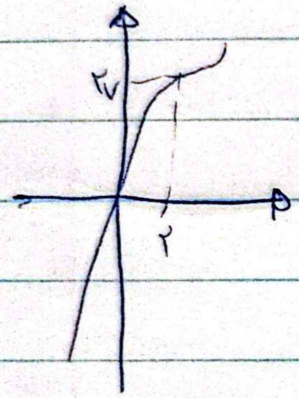
$-\sqrt{2}$	$\sqrt{2}$	$\frac{3}{2}$

$- \mid + \mid - \mid +$

ق ق

$$x<0 \quad \text{و} \quad x<-\sqrt{2} \Rightarrow D_f = (-\infty, -\sqrt{2})$$

سوال ۳



$$\sqrt{28f(x)-f^2(x)} \Rightarrow 28f(x)-f(x)^2 \geq 0$$

$$\Rightarrow f(x)(28-f(x)) \geq 0$$

0	28

$- \mid + \mid -$

$$f(x) \in [0, 28] \Rightarrow f(x) = \frac{27}{8}(x-2)^3+27$$

$$\frac{27}{8}(x-2)^3+27=28 \Rightarrow \frac{27}{8}(x-2)^3=1 \Rightarrow$$

$$(x-2)^3=\frac{8}{27} \to x-2=\frac{2}{3} \Rightarrow x=\frac{8}{3}$$

$$0 \le x \le \frac{8}{3} \Rightarrow \{0, 1, 2\} \to \text{سه عدد}$$

سوال ۴

$0 \le ax < 1 \xrightarrow{a<0}$ a منفی باشد جزء درازای هر عدد منفی کوچکتر مثل ۱ است - اگر a مثبت باشد برابر صفر می‌شد و اگر a منفی باشد برابر ۱- می‌شد و در نتیجه حاصل برابر صفر می‌شد

$$\frac{1}{a} < x \le 0 \to \frac{\frac{1}{a}}{a}\left[a \times \frac{1}{a}\right] \to \frac{1}{a^2}=\frac{1}{4} \to a=\pm 2 \Rightarrow \boxed{a=-2}$$

$f(x)=\frac{x}{-2}[-2x] \to$ انقباض افقی

با جهش ۲۵ ← $b=1 \Rightarrow b-a=1-(-2)=3$