۱_ $y = -\frac{1}{3}(x-4)^2+3 \xrightarrow{y=0} -\frac{1}{3}(x-4)^2+3=0 \Rightarrow (x-4)^2=9 \Rightarrow x-4=\pm 3$

$\Rightarrow x = \boxed{1,7}$

۲_ $3x+2=1 \Rightarrow x=-\frac{1}{3} \Rightarrow \alpha \qquad y = 1-2f(\underbrace{3\times(-\tfrac{1}{3})+2}_{1}) = 1-2(4) = -7 \Rightarrow \beta$

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

۳_ $y = 3-\sqrt{2x} \Rightarrow 3-\sqrt{2(x+1)} \Rightarrow -\left(3-\sqrt{2(x+1)}\right) \longrightarrow -\left(3-\sqrt{2(x+1)}\right)+5$

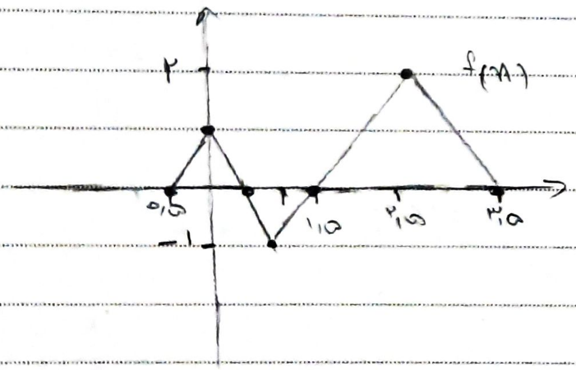
$= \sqrt{2x+2}+2 \qquad \sqrt{2x+2}+2 = \frac{7}{2} \Rightarrow \sqrt{2x+2} = \frac{3}{2} \Rightarrow 2x+2 = \frac{9}{4}$

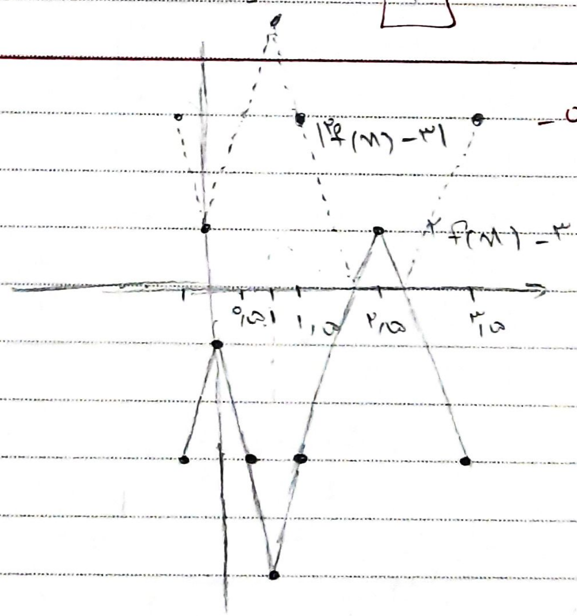
$2x = \frac{1}{4} \Rightarrow \boxed{x=\frac{1}{8}}$

۴_ $-1 < x+1 < b \Rightarrow -2 < x < b-1 \qquad a < x-1 < 4 \Rightarrow a+1 < x < 5$

$\Rightarrow a+1=-2 \Rightarrow a=-3 \qquad b-1=5 \Rightarrow b=6 \qquad a-b = -3-6 = \boxed{-9}$

۵_





$y = \sqrt{|2f(x)-3|} \Rightarrow |2f(x)-3| \geq 0$

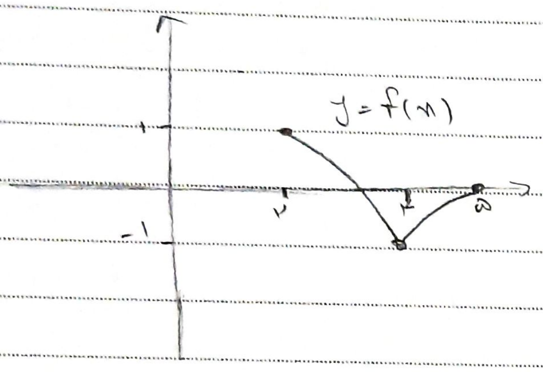
$\Rightarrow D_{\sqrt{2f(x)-3}} = \boxed{[-0.5, 3.5]}$

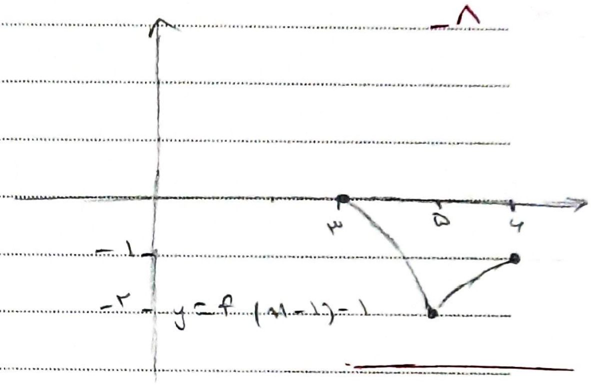
$y=\log_2 x \to \log_2 (x-2) \to -\log_2 (x-2) \to -\log_2 (x-2)+3 \to -\log_2 (-(x-2))+3 = -\log_2 (2-x)+3$ — ۷

$g(-14) = -\log_2 (2-(-14)) + 3 = -1 \qquad g(-62) = -\log_2 (2-(-62)) + 3 = -3$

$-1+(-3) = \boxed{-4}$

— ۸





$f(x) = \left|\frac{x+1}{2x+1}\right| \to \left|\frac{(x-2)+1}{2(x-2)+1}\right| + 1 = \left|\frac{x-1}{2x-3}\right| + 1 \qquad \left|\frac{x-1}{2x-3}\right| + 1 + x < 0$ — ۹

$\to -x-1 > 0 \Rightarrow \underset{\mathrm{I}}{x < -1}$

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

$\frac{x-1}{2x-3} - x - 1 > 0 \qquad \frac{x-1}{2x-3} + 1 + x < 0 \to \frac{-4+2x^2}{2x-3} < 0$

$\to \frac{-2x^2+2x+2}{2x-3} > 0$

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

$\frac{1-\sqrt{5}}{2}$		$\frac{3}{2}$		$\frac{1+\sqrt{5}}{2}$	
$+$	$-$		$+$		$-$

$x \in \overset{\mathrm{II}}{(-\infty, -\sqrt{2})} \cup (\frac{3}{2}, +\infty)$

غ ق ق چون باید $x<-1$

$x \in (\frac{1-\sqrt{5}}{2}, \frac{3}{2}) \cup (\frac{1+\sqrt{5}}{2}, +\infty)$ غ ق ق چون باید $x<-1$

$\boxed{\mathrm{I} \cap \mathrm{II} = (-\infty, -\sqrt{2})}$

پردیس ایرانیو ۱

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۱۰ـ

ضابطه f را : $(x-2)^3+27$

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

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

$\begin{array}{ccccc} & 0 & & 28 & \\ - & | & + & | & - \end{array} \Rightarrow f(x)\in[0,28]$

$\Rightarrow 0\leq (x-2)^3+27\leq 28 \Rightarrow -27\leq (x-2)^3\leq 1 \Rightarrow -3\leq x-2\leq 1$

$\boxed{-1\leq x\leq 3}$ ⇐ $\boxed{\text{۵ عدد صحیح}}$