

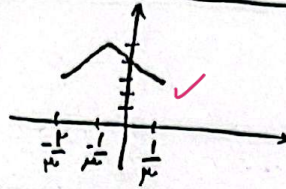
① $D_{f(x)} = [-2, 4] \rightarrow -2 \leq x \leq 4 \rightarrow -1 \leq 3x+2 \leq 14 \rightarrow -5 \leq x \leq 4 \rightarrow D_f = [-5, 4]$ (۲)

② $D_{f(3x-2)} = [-2, 3] \rightarrow -2 \leq x \leq 3 \rightarrow -2 \leq 3x \leq 9 \rightarrow -1 \leq 3x-2 \leq 7 \rightarrow D_f = [-1, 7]$ (۲)

③ $D_{f(\frac{3x+1}{2})} = [-1, 2] \rightarrow -1 \leq x \leq 2 \rightarrow -3 \leq 3x \leq 6 \rightarrow -2 \leq 3x+1 \leq 1 \rightarrow -1 \leq \frac{3x+1}{2} \leq 2$ (۲)

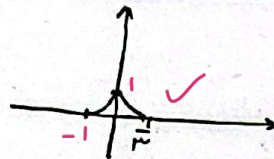
$D_{f(2-\omega x)} \Rightarrow -1 \leq 2-\omega x \leq \omega \rightarrow -3 \leq -\omega x \leq \omega-2 \rightarrow -\frac{3}{\omega} \leq x \leq \frac{\omega-2}{\omega} \rightarrow D_f = \left[-\frac{3}{\omega}, \frac{\omega-2}{\omega}\right]$

④ $(-1, 0) \rightarrow 3x+1 \leq -1 \rightarrow x \leq -\frac{2}{3}$
 $(0, 1) \rightarrow 3x+1 \geq 0 \rightarrow x \geq -\frac{1}{3}$
 $(2, 0) \rightarrow 3x+1 \leq 2 \rightarrow x \leq \frac{1}{3}$



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⑤ $(1, 0) \rightarrow 2-3x \geq 1 \rightarrow x \leq \frac{1}{3}$
 $(2, 1) \rightarrow 2-3x \leq 2 \rightarrow x \geq 0$
 $(4, 0) \rightarrow 2-3x \geq 4 \rightarrow x \leq -\frac{2}{3}$



⑥ ~~scribbles~~

⑦ $(1, \epsilon) \rightarrow 3\alpha+2=1 \rightarrow \alpha = -\frac{1}{3}$
 $1-2(\epsilon) \leq \beta \leq -\frac{1}{3}$
 $\alpha, \beta \in [-\frac{1}{3}, -\frac{1}{3}] \rightarrow \alpha = \beta = -\frac{1}{3}$

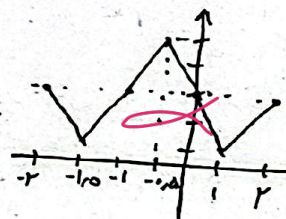
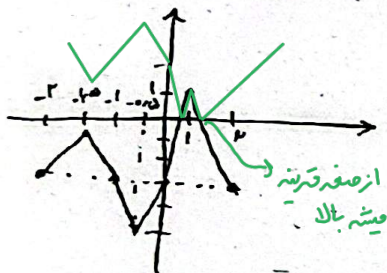
صغری آفر

⑧ $D_{f(x-1)} = (a+1, \omega)$
 $D_{g(x+1)} = [-2, b-1]$
 $a+1 \leq -2 \rightarrow a \leq -3$
 $b-1 \geq \omega \rightarrow b \geq \omega+1$
 $a-b \leq -3 - (\omega+1) = -4 - \omega$

⑨ $f = \left(\frac{x}{2} + 1\right) \rightarrow D_{f(x)} = \left[-\frac{2}{3}, \frac{2}{3}\right]$

$D = [-2, \omega] \rightarrow [-\epsilon, \epsilon] \rightarrow [-2, 2]$

$R_{f(x)} = [-1, 2] \xrightarrow{x^2} [-1, 4] \xrightarrow{-3} [-4, 1]$



$R = [-4, 1]$
 $D = [-2, 2]$

صغری آفر

۱۰ $g(x) = \left| \frac{(x-1)t}{2(x-1)+1} \right| = \left| \frac{3x-1}{2x-1} \right|$
 $x + \left| \frac{3x-1}{2x-1} \right| < 0$
 $x + \frac{1-3x}{1-2x} < 0$
 $x + \frac{3x-1}{2x-1} < 0$

۱ واحد مربعی باد مال و ضلع

صغری آفر

$$D_{y_1} = [-3, 5] \rightarrow -3 \leq x \leq 5 \rightarrow -\frac{1}{3} \leq \frac{x}{3} + 1 \leq \frac{4}{3} \Rightarrow D_f = \left[-\frac{1}{3}, \frac{4}{3}\right]$$

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$$R_{y_1} = [-1, 2] \rightarrow -1 \leq f \leq 2 \rightarrow -5 \leq 2f - 3 \leq 1 \rightarrow 0 \leq |2f - 3| \leq 5$$

$$0 \leq \sqrt{|2f - 3|} \leq \sqrt{5} \Rightarrow R_f = [0, \sqrt{5}]$$

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

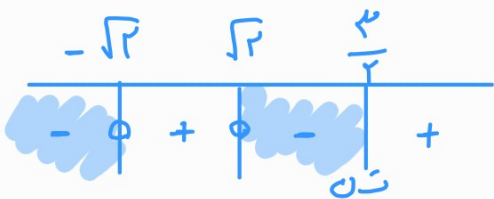
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$$x + g(x) < 0 \rightarrow \left| \frac{x-1}{2x-3} \right| < -1 - x$$

$$< -1 - x$$

از به قدر مطلق بزرگتر شده پس باید مثبت باشد: $-1 - x > 0 \rightarrow x < -1$

$$\frac{x < -1}{\text{قدر مطلق مثبت}} \rightarrow \frac{x-1}{2x-3} < -1 - x \rightarrow \frac{2x^2 - 4}{2x-3} < 0 \rightarrow \frac{2(x-\sqrt{2})(x+\sqrt{2})}{2x-3} < 0$$



$$x < -1 \rightarrow x < -\sqrt{2} \rightarrow (-\infty, -\sqrt{2})$$

$$\text{رأس: } (h, k) \xrightarrow{\text{معادله خط}} y = a(x-h)^2 + k = -\frac{1}{3}x^2 + \frac{2}{5}x + 1 \rightarrow a = -\frac{1}{3}$$

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$$\text{رأس: } (4, 3) \rightarrow y = -\frac{1}{3}(x-4)^2 + 3 \xrightarrow{y=0} -\frac{1}{3}(x-4)^2 = -3 \rightarrow \begin{cases} x=7 \\ x=1 \end{cases}$$