

$$D_{f(x)} = [-2, 4]$$

$$-2 \leq \frac{3x+2}{a} \leq 4 \rightarrow -1 \leq 3x+2 \leq 4 \rightarrow -12 \leq 3x \leq 18 \rightarrow -4 \leq x \leq 6$$

$$D_{f(\frac{3x+2}{a})} = [-4, 4] \quad \text{سوال ۱}$$

$$D_{f(3x-2)} = [-2, 3]$$

$$\begin{cases} 3(-2)-2 = -8 \\ 3(3)-2 = 7 \end{cases} \rightarrow D_{f(x)} = [-8, 7]$$

سوال ۲

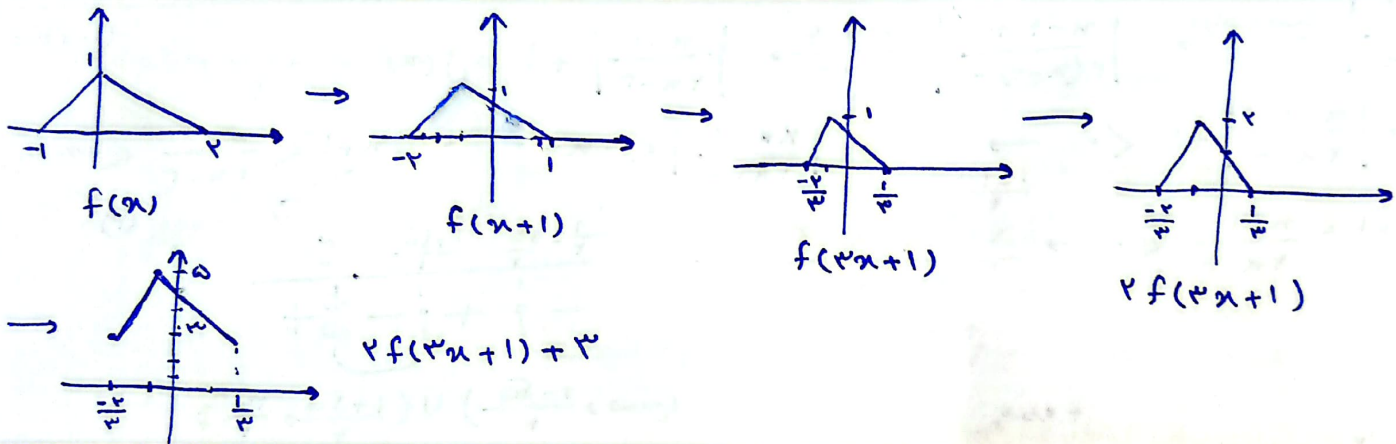
$$D_{f(\frac{3x+1}{4})} = [-1, 3]$$

سوال ۳

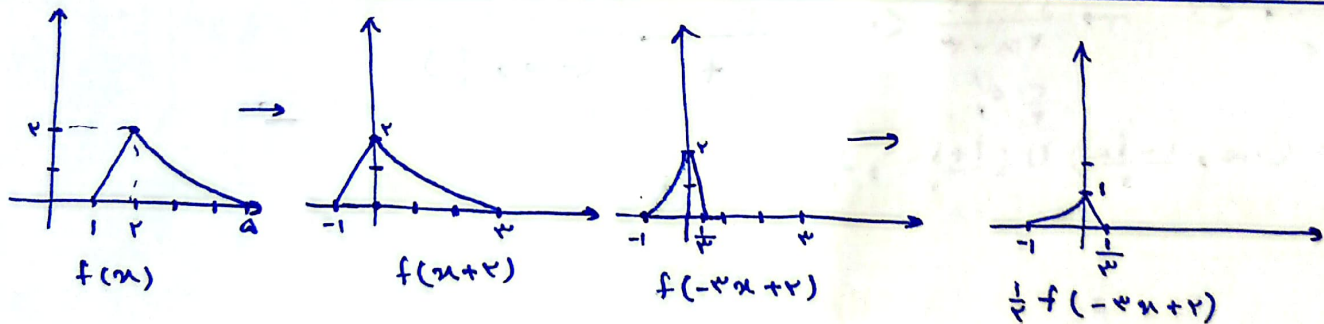
$$\begin{cases} \frac{3(-1)+1}{4} = -1 \\ \frac{3(3)+1}{4} = 3 \end{cases} \rightarrow D_{f(x)} = [-1, 3] \rightarrow -1 \leq 2-5x < 3 \rightarrow -3 \leq -5x < 3$$

$$\frac{-3}{5} < x \leq \frac{3}{5} \rightarrow D_{f(2-5x)} = (-\frac{3}{5}, \frac{3}{5}]$$

سوال ۴



سوال ۵



سوال ۶

$$y = \frac{1}{3}x^2 + \frac{2}{a}x + 1 \xrightarrow{(3)} (\frac{x}{a}, \frac{2x}{a})$$

رأس تابع
جیب = (4, 3)

$$\frac{x}{a} \rightarrow 4$$

$$\frac{x}{a} + z = 4 \rightarrow z = \frac{14}{a}$$

$$\frac{2x}{a} \rightarrow 3$$

$$\frac{2x}{a} + a = 3 \rightarrow a = \frac{47}{2a}$$

$$\frac{1}{3}x^2 + \frac{2}{a}x + 1 + \frac{47}{2a} = 0 \xrightarrow{\times 2a} -2ax^2 + 4x - 214 = 0 \rightarrow x^2 - 2x - 107 = 0$$

$$\rightarrow (x-9)(x+4) \rightarrow x = \frac{9 \pm \sqrt{121}}{2} \rightarrow \frac{18}{2} + \frac{14}{2} = \frac{32}{2} = 16$$

$$\rightarrow x = \frac{-2 \pm \sqrt{4 + 428}}{2} \rightarrow \frac{-2 \pm \sqrt{432}}{2} = \frac{-2 \pm 20.3}{2} = 9 \text{ or } -11$$

$$f \text{ تابع } y_s = f \quad y_s \text{ تابع جديد} = -2(y_s) + 1 \Rightarrow -2(4) + 1 = -7 = \beta$$

$$f \text{ تابع } x_s = 1 \quad x_s \text{ تابع جديد} = \frac{x_s - 2}{3} \rightarrow \frac{1-2}{3} = \frac{-1}{3} = \alpha \quad \alpha\beta = -7 \times \frac{-1}{3} = \frac{7}{3}$$

$$D_f = (a, 4] \rightarrow D_{f(x-1)} = (a+1, 5]$$

$$D_g = [-1, b) \rightarrow D_{g(x+1)} = [-2, b-1)$$

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

$$\rightarrow D_{f(x-1)} = (-2, 5) \cap D_{g(x+1)} = [-2, 5) \rightarrow \begin{cases} a = -3 \\ b = 4 \end{cases} \quad a-b = -3-4 = -7$$

$$R_{y_1} = [-1, 2] \quad R_{y_2} = \sqrt{|2R_{y_1} - 3|} = \sqrt{[0, 5]} = [0, \sqrt{5}]$$

$$|2f(x) - 3| \geq 0 \rightarrow D_{y_2} = \mathbb{R}$$

$$f(x) = \left| \frac{x+1}{2x+1} \right| \xrightarrow{\text{۲ واحد راست}} \left| \frac{x-2+1}{2(x-2)+1} \right| \xrightarrow{\text{يك واحد بالا}} \left| \frac{x-1}{2x-3} \right| + 1 = g(x)$$

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

$$\textcircled{1} \quad x+1 + \frac{x-1}{2x-3} < 0 \rightarrow \frac{x^2 - 2x - 2}{2x-3} < 0 \quad \begin{array}{c} \frac{1+\sqrt{5}}{2} \\ \frac{1-\sqrt{5}}{2} \end{array}$$

$\frac{1-\sqrt{5}}{2} \quad \frac{1+\sqrt{5}}{2} \quad \frac{3}{2}$
 $- \quad + \quad - \quad +$
 $(-\infty, \frac{1-\sqrt{5}}{2}) \cup (\frac{1+\sqrt{5}}{2}, \frac{3}{2})$

$$\textcircled{2} \quad \frac{x-1}{2x-3} < -x-1 \rightarrow \frac{2x^2 + 2}{2x-3} < 0 \quad \begin{array}{c} \frac{3}{2} \\ - \quad + \end{array} \quad (-\infty, \frac{3}{2})$$

$$\textcircled{1} \cap \textcircled{2} = (-\infty, \frac{1-\sqrt{5}}{2}) \cup (\frac{1+\sqrt{5}}{2}, \frac{3}{2})$$