

$$y = -\frac{1}{3}x^3 + \frac{1}{3}x + 1 \Rightarrow y = -\frac{1}{3}(x-1)^3 + 1 \xrightarrow{y=0} -\frac{1}{3}(x-1)^3 + 1 = 0 \Rightarrow (x-1)^3 = 3$$

$$\Rightarrow x-1 = \pm \sqrt[3]{3} \Rightarrow \begin{cases} x=1 \\ x=1 \pm \sqrt[3]{3} \end{cases} \quad \checkmark$$

$$g(x) = y = 1 - \frac{1}{3}f(3x+1)$$

$$f \rightarrow x_5 = 1 \xrightarrow{f(3x+1)} g \rightarrow x_5 = -\frac{1}{3} = \alpha$$

$$f \rightarrow y_5 = 1 \xrightarrow{1 - \frac{1}{3}f} g \rightarrow y_5 = -1 = \beta \quad \rightarrow \alpha/\beta = \left(-\frac{1}{3}\right) \times (-1) = \frac{1}{3} \quad \checkmark$$

$$y = 3 - \sqrt{2x} \xrightarrow{\text{باز کردن}} y = 3 - \sqrt{2(x+1)} \xrightarrow{\text{باز کردن}} y = \sqrt{2x+2} - 3 \xrightarrow{\text{باز کردن}} y = \sqrt{2x+2} + 2$$

$$\sqrt{2x+2} + 2 = \frac{1}{2} \Rightarrow \sqrt{2x+2} = -\frac{3}{2} \Rightarrow 2x+2 = \frac{9}{4} \Rightarrow 2x = \frac{1}{4} \Rightarrow x = \frac{1}{8} \quad \checkmark$$

$$h(x) = f(x+1) + g(x+1) \quad D_h = D_{f(x+1)} \cap D_{g(x+1)} = (-2, 5) \Rightarrow (a+1, \omega) \cup [-1, b-1] = (-2, 5)$$

$$D_f = (a, 5]$$

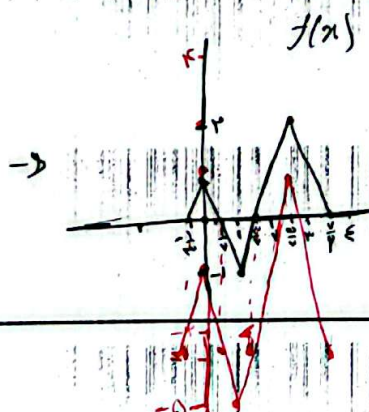
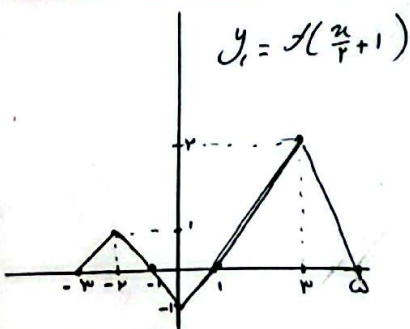
$$D_{f(x+1)} = (a+1, \omega]$$

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

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

$$\Rightarrow \begin{cases} a+1 = -2 \\ b-1 = 5 \end{cases} \Rightarrow \begin{cases} a = -3 \\ b = 6 \end{cases} \quad \checkmark$$

$$a \cdot b = -3 \cdot 6 = -18 \quad \checkmark$$



$$D_y \rightarrow |2f(x) - 3| \geq 0$$

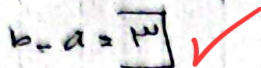
$$D_y = D_f \Leftrightarrow \text{مجموعه حقیقی}$$

$$D_y = [-1, \frac{5}{2}] \quad \checkmark$$

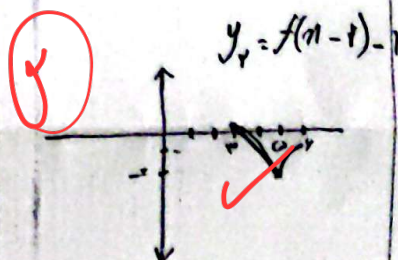
$$R_y = [-\omega, 1]$$

$$\rightarrow R_{f(x)-3} = [0, \omega] \quad \checkmark$$

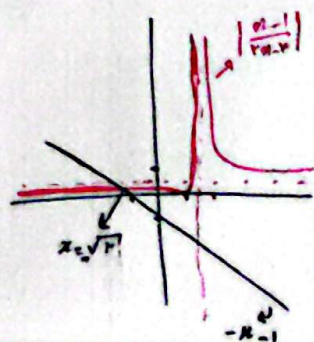
$$\rightarrow R_{\sqrt{f(x)-3}} = [0, \sqrt{\omega}] \quad \checkmark$$



$$\rightarrow g(-1.8) + g(-4.1) = -1 + (-.7) = \boxed{-1.7}$$



$$2) \text{ مخرج: } (-\infty, -\sqrt{2})$$



$$(a \cdot v) \cdot \frac{1}{v} = m = \frac{1}{v}$$