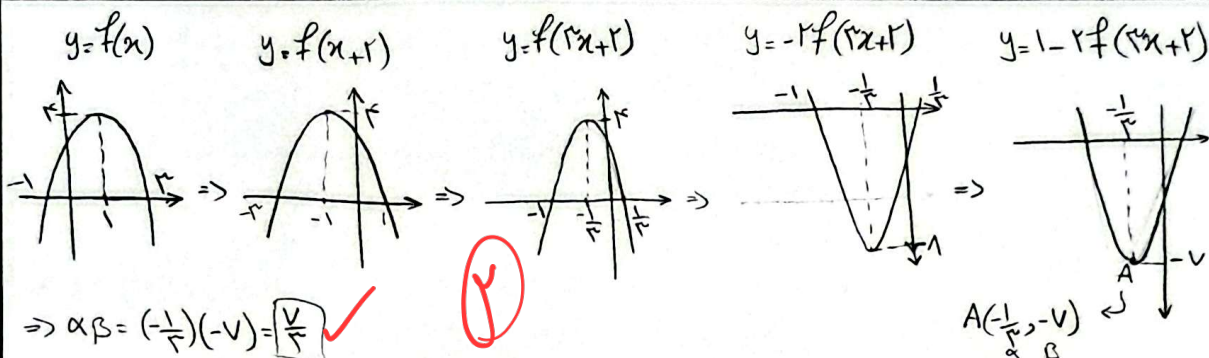


$$y = -\frac{1}{4}x^2 + \frac{1}{2}x + 1 = -\frac{1}{4}(x - x_{\text{استرمین}})^2 + y_{\text{استرمین}} \xrightarrow{\text{رأس منحنی}} y = -\frac{1}{4}(x-2)^2 + 2$$

$$\hookrightarrow y=0 \Rightarrow -\frac{1}{4}(x-2)^2 + 2 = 0 \Rightarrow (x-2)^2 = 8 \Rightarrow x-2 = \pm 2\sqrt{2} \Rightarrow x = 2 \pm 2\sqrt{2}$$

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$$y = 2 - \sqrt{2x} \xrightarrow{\text{جایگزینی}} y = 2 - \sqrt{2(x+1)} \xrightarrow{\text{تغییر متغیر}} y = \sqrt{2(x+1)} - 2 \xrightarrow{\text{جایگزینی}} y = \sqrt{2(x+1)} - 2 + 1$$

$$\Rightarrow y = \sqrt{2x+2} + 1 \Rightarrow \sqrt{2x+2} + 1 = \frac{1}{\sqrt{2}} \Rightarrow \sqrt{2x+2} = \frac{1}{\sqrt{2}} - 1 \Rightarrow 2x+2 = \left(\frac{1}{\sqrt{2}} - 1\right)^2 \Rightarrow x = \frac{1}{2}$$

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$$y = f(x-1) + g(x+1) \Rightarrow D = (-\infty, \infty)$$

$$D_f = (a, b] \rightarrow f(x) \quad f(x-1)$$

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

$$\hookrightarrow g(x) \quad g(x+1)$$

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

$$\hookrightarrow a < x-1 < b \Rightarrow a+1 < x < b+1 \Rightarrow D_{f(x-1)} = (a+1, b+1)$$

$$\Rightarrow a-b = -2-4 = -6$$

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$$y = \sqrt{|2f(x)-5|} \xrightarrow{\text{تغییر متغیر}} |2f(x)-5| \xrightarrow{\text{تغییر متغیر}} D_y = D_{2f(x)}$$

$$y = f\left(\frac{x}{2}+1\right) \Rightarrow y = f(x)$$

$$D_f = [-2, 5] \Rightarrow D_{f(x)}?$$

$$\hookrightarrow -2 \leq x \leq 5$$

$$-\frac{2}{2} \leq \frac{x}{2} \leq \frac{5}{2} \Rightarrow -1 \leq \frac{x}{2} \leq \frac{5}{2} \Rightarrow D_f = [-1, \frac{5}{2}] \Rightarrow D_y = [-1, \frac{5}{2}]$$

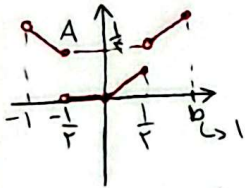
$$R_f = [0, \sqrt{5}]$$

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$$y = \frac{x}{a} [ax] \Rightarrow 0 \leq ax < 1 \Rightarrow \frac{0}{a} \leq x < \frac{1}{a} \quad y = \frac{x}{a} [ax] \Rightarrow a < 0$$

$$[ax] = 0 \quad \frac{1}{a} < x \leq 0 \Leftrightarrow y = 0$$

(مربع)



$$1 \leq ax < 2 \Rightarrow \frac{1}{a} \leq x < \frac{2}{a} \quad y = \frac{x}{a}$$

$$[ax] = 1$$

$$y = \frac{x}{-r} [-rx] \quad \text{مربع} \quad \Rightarrow b = rx \frac{1}{r} = 1 \quad \Rightarrow b - a = 1 - (-r) = r+1$$

$$A\left(\frac{1}{a}, \frac{1}{r}\right) \Rightarrow \frac{1}{a} = \frac{1}{r} \Rightarrow ar = 1 \Rightarrow a = \pm r \quad a < 0 \Rightarrow a = -r$$

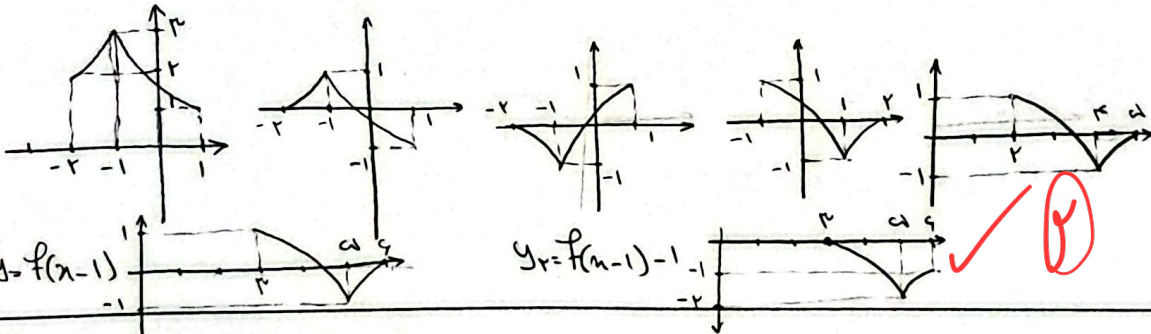
$$f(x) = \log_r x \xrightarrow{\text{مربع}} y = \log_r^{x+r} \xrightarrow{\text{مربع}} y = -\log_r^{x+r} \xrightarrow{\text{مربع}} y = -\log_r^{x+r} + r \xrightarrow{\text{مربع}} y = -\log_r^{-x+r} + r$$

$$\Rightarrow g(x) = -\log_r^{-x+r} + r \rightarrow g(-1r) = -\log_r^{-(1r)+r} + r = -r + r = -1$$

$$\rightarrow g(-4r) = -\log_r^{-(-4r)+r} + r = -9 + r = -r$$

$$\Rightarrow g(-1r) + g(-4r) = -1 - r = -r-1$$

$$y_1 = r - f(r-x) \quad y = -f(r-x) \quad y = f(r-x) \quad y = f(r+x) \quad y = f(x)$$



$$f(x) = \left| \frac{x+1}{rx+1} \right| \xrightarrow{\text{مربع}} f(x) = \left| \frac{(x-r)+1}{r(x-r)+1} \right| \xrightarrow{\text{مربع}} g(x) = \left| \frac{x-1}{rx-r} \right| + 1$$

$$x + g(x) < 0 \Rightarrow x + 1 + \left| \frac{x-1}{rx-r} \right| < 0 \Rightarrow \left| \frac{x-1}{rx-r} \right| < -(x+1)$$

$$\frac{x-1}{rx-r} < -(x+1) \Rightarrow \frac{rx-r}{rx-r} < 0 \Rightarrow \frac{rx-r}{rx-r} < 0$$

$$\frac{1}{x} > 0 \Rightarrow x \in (-\infty, -r) \quad \frac{x-1}{rx-r} < -(x+1) \Rightarrow \frac{rx-r}{rx-r} < 0 \Rightarrow \frac{rx-r}{rx-r} < 0$$

$$y = x^r$$

$$\rightarrow f(x) = (x-r)^r + r$$

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$$g(x) = \sqrt{-f(x) + r}$$

$$g(x) = \sqrt{-f(x) + r}$$

$$f(x) = \frac{rv}{\lambda} (x-r)^r + rv$$

$$f(x) = r \Rightarrow (x-r)^r + r = r \Rightarrow (x-r)^r = 0 \Rightarrow x-r = 0 \Rightarrow x = r$$

$$f(x) = 0 \Rightarrow (x-r)^r + r = 0 \Rightarrow (x-r)^r = -r \Rightarrow x-r = -r \Rightarrow x = 0$$

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$$\frac{-1}{-r} + \frac{r}{r} \Rightarrow D_g = [-1, r] \rightarrow -1, 0, 1, r$$

$$D_f = \left[0, \frac{1}{r}\right]$$

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