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$$-1 \leq \frac{v_{n+1}}{a} \leq 1 \Rightarrow -1 \leq v_{n+1} \leq 1 \Rightarrow -1 \leq v_n \leq 1 \Rightarrow -1 \leq n \leq 1$$

$$Df\left(\frac{v_{n+1}}{a}\right) = [-1, 1]$$

$$Df(v_{n+1}) = [-1, 1] \rightarrow \begin{aligned} n = -1 &\rightarrow v(-1) - 1 = -1 \\ n = 1 &\rightarrow v(1) - 1 = 1 \end{aligned} \Rightarrow Df = [-1, 1]$$

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$$Df\left(\frac{v_{n+1}}{r}\right) = [-1, 1] \rightarrow \begin{aligned} n = -1 &\Rightarrow \frac{v(-1)+1}{r} = -1 \\ n = 1 &\Rightarrow \frac{v(1)+1}{r} = 1 \end{aligned} \Rightarrow Df = [-1, 1]$$

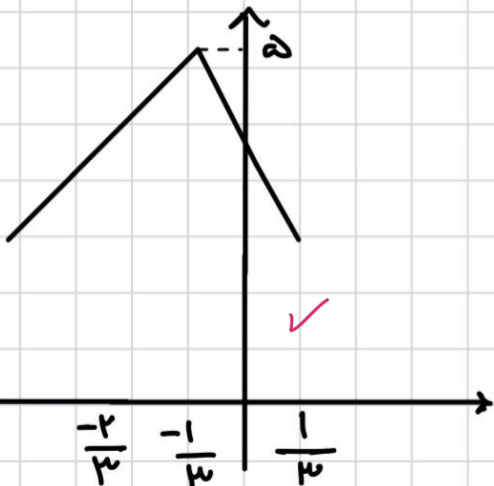
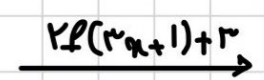
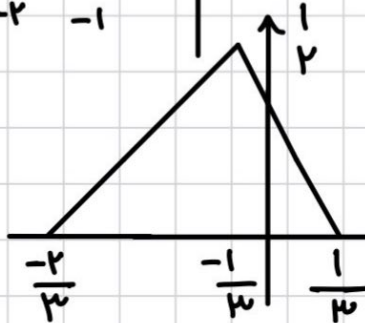
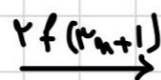
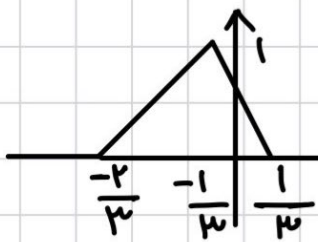
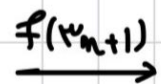
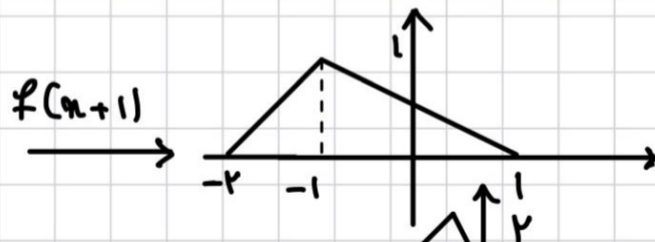
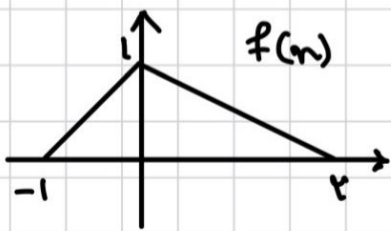
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$$-1 \leq \frac{v_{n+1}}{a} \leq 1 \Rightarrow -1 \leq v_{n+1} \leq 1 \Rightarrow -1 \leq v_n \leq 1 \Rightarrow Df\left(\frac{v_{n+1}}{a}\right) = \left[-\frac{1}{a}, \frac{1}{a}\right]$$

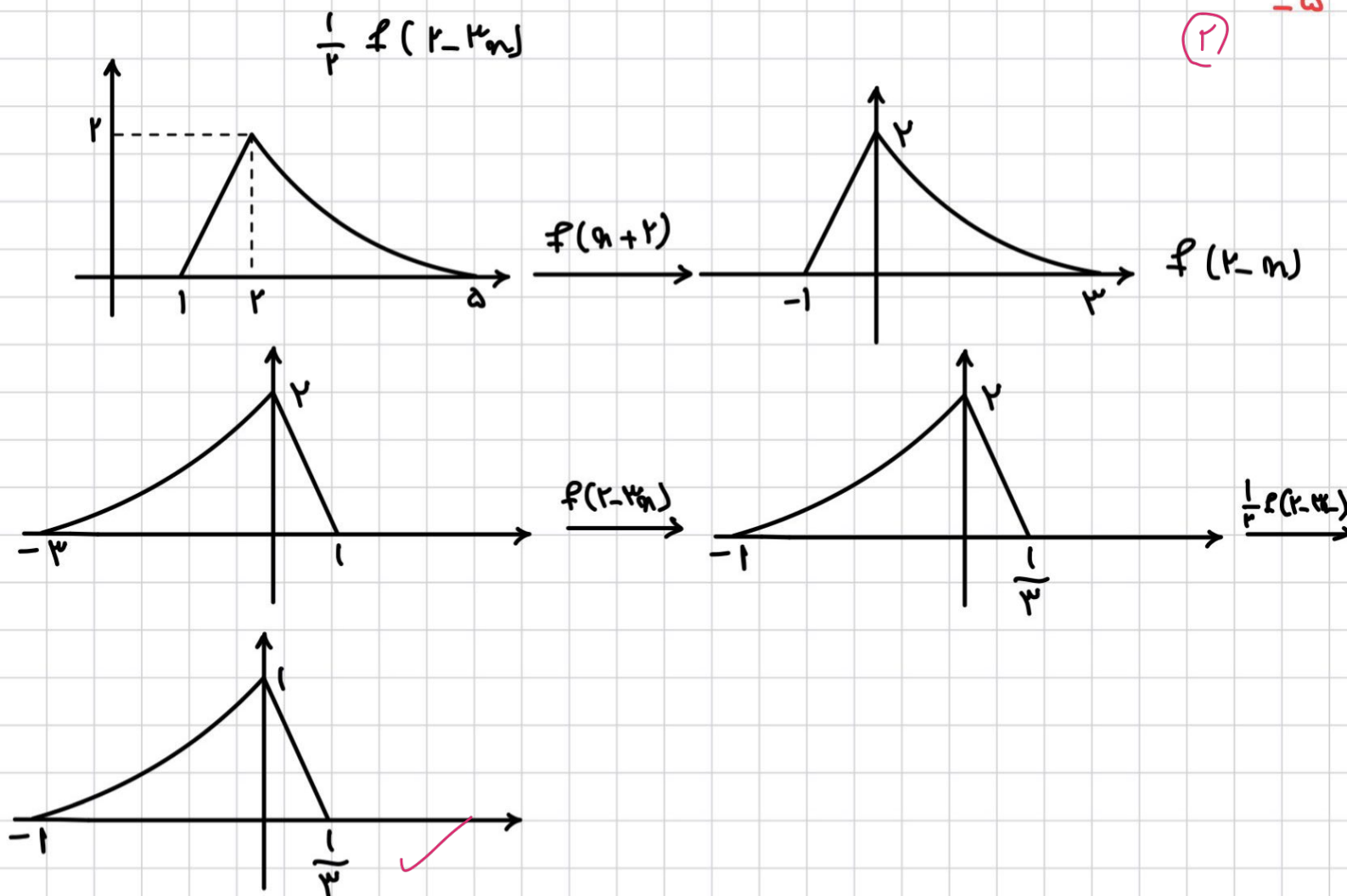
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$$y = -\frac{1}{r}x^2 + \frac{r}{a}x + 1 \rightarrow -\frac{b}{2a} = \frac{-\frac{r}{a}}{-\frac{2}{r}} = \frac{r}{2a} \quad \text{at } \left| \begin{array}{c} \frac{r}{a} \\ \frac{r}{2a} \end{array} \right| \xrightarrow[\text{مستأخر}]{\text{نقطة}} (r, r)$$

$$r - \frac{r}{a} = \frac{1}{a}$$

$$r - \frac{r}{2a} = \frac{r}{2a}$$

$$y = -\frac{1}{r} \left(x^2 - \frac{r}{a}x \right) + 1 = -\frac{1}{r} \left[\left(x - \frac{r}{2a} \right)^2 - \frac{r^2}{4a^2} \right] + 1 =$$

$$\Rightarrow -\frac{1}{r} \left(x - \frac{r}{2a} \right)^2 + \frac{r}{4a} \rightarrow y = -\frac{1}{r} (x - r)^2 + r \xrightarrow{y=0}$$

$$\frac{1}{r} (x - r)^2 = r \Rightarrow (x - r)^2 = r^2 \Rightarrow x - r = \pm r \Rightarrow$$

$$x = r, 1$$

$$r_{n+r} = 1 \Rightarrow n = \frac{1}{r} \Rightarrow y = 1 - r f\left(\frac{r_{n+r}}{r}\right) = 1 - 1 = -1 \Rightarrow \beta = -1$$

(2) -1

$$\alpha\beta = +\frac{r}{r}$$

دقیقاً

$$\begin{aligned} a < n-1 < c &\rightarrow a+1 < n < a \\ -1 < n+1 < b &\Rightarrow -2 < n < b-1 \end{aligned}$$

$$\left. \begin{aligned} (a+1, a] \cap [-2, b-1) &= (-2, a) \Rightarrow (2) \\ a+1 &= -2 \Rightarrow a = -3 \\ b-1 &= a \Rightarrow b = -2 \end{aligned} \right\} a-b = -9$$

$$\begin{aligned} -2 < n < a &\Rightarrow -\frac{2}{f} < \frac{n}{f} < \frac{a}{f} \Rightarrow -\frac{1}{f} < \frac{n}{f} + 1 < \frac{a}{f} \Rightarrow D_{y_r} = \left[-\frac{1}{f}, \frac{a}{f}\right] (2) \\ -1 < f < 2 &\Rightarrow -2 < 2f < 4 \Rightarrow -2 < 2f-3 < 1 \Rightarrow 0 < |2f-3| < 2 \Rightarrow \end{aligned}$$

$$0 < \sqrt{|2f-3|} < \sqrt{2} \Rightarrow R_{y_1} = [0, \sqrt{2}]$$

$$f(n) = \left| \frac{n+1}{r_{n+1}} \right| \xrightarrow{\text{واحد، راست}} \left| \frac{(n-2)+1}{r_{(n-2)+1}} \right| \xrightarrow{\text{یک، بالا}} g(n) = \left| \frac{n-1}{r_{n-2}} \right| + 1$$

$$n + g(n) < 0 \Rightarrow n + \underbrace{\left| \frac{n-1}{r_{n-2}} \right| + 1}_{\text{تاسنی}} < 0 \Rightarrow n < -1 \Rightarrow \text{قدر مطلق} \Rightarrow$$

$$n+1 + \frac{n-1}{r_{n-2}} < 0 \Rightarrow \frac{(n+1)(r_{n-2}) + (n-1)}{r_{n-2}} < 0 \Rightarrow \frac{r(n^2-2)}{r_{n-2}} < 0 \Rightarrow$$

$\underbrace{r(n^2-2)}_{\text{عدد منتهی}} < 0 \Rightarrow n < -1$

$$n^2-2 > 0 \Rightarrow n^2 > \sqrt{2} \Rightarrow \begin{aligned} n > \sqrt{2} &\quad n < -1 \\ n < -\sqrt{2} &\rightarrow \end{aligned} \rightarrow (-\infty, -\sqrt{2})$$