

$$f(n) \rightarrow D_f = [-2, 4]$$

$$f\left(\frac{n+1}{2}\right) \rightarrow ?$$

$$-2 \leq \frac{n+1}{2} \leq 4 \rightarrow -1 \leq \frac{n+1}{2} \leq 4 \rightarrow -2 \leq n+1 \leq 8 \rightarrow -3 \leq n \leq 7$$

$$= D_f = [-3, 7]$$

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$$f(n-2) \rightarrow D_f = [-2, 4]$$

$$\rightarrow -2 \leq n-2 \leq 4 \Rightarrow -4 \leq n \leq 6 \Rightarrow -1 \leq n-2 \leq 4$$

$$\hookrightarrow D_{f(n)} = [-1, 4]$$

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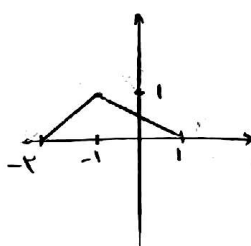
$$f\left(\frac{n+1}{2}\right) \rightarrow D = [-1, 3] \Rightarrow -1 \leq n \leq 3 \rightarrow -2 \leq n \leq 4 \rightarrow -2 \leq \frac{n+1}{2} \leq 4 \rightarrow -1 \leq \frac{n+1}{2} \leq 4$$

$$f(x-\omega) \rightarrow D = ? \quad -1 \leq x-\omega \leq 4 \rightarrow -2 \leq x \leq 5 \rightarrow \frac{x}{\omega} \geq x \geq -\frac{x}{\omega}$$

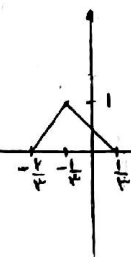
$$\Rightarrow D_f = \left[-\frac{x}{\omega}, \frac{x}{\omega}\right]$$

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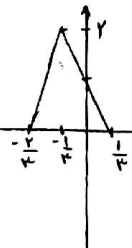
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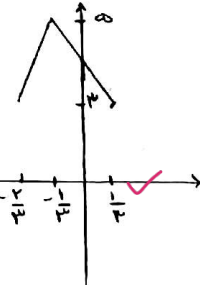
$$y = f(n+1)$$



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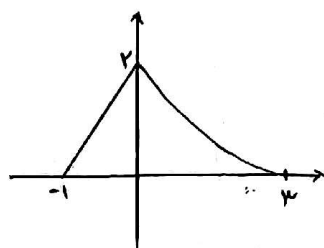
$$y = 2f(n+1)$$



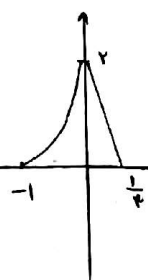
$$y = 2f(n+1) + 2$$

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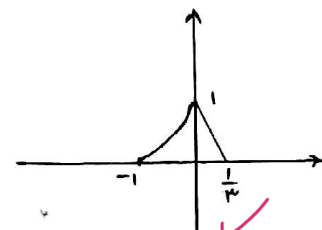
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$$y = f(a+r)$$



$$y = f(-n+r)$$



$$y = \frac{1}{r} f(r-n)$$

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$$y = a(n-h)^r + k \xrightarrow{(r, r)} y = -\frac{1}{r}(n-r)^r + r$$

$$y=0 \rightarrow -\frac{1}{r}(n-r)^r + r = 0 \Rightarrow -\frac{1}{r}(n-r)^r = -r \Rightarrow (n-r)^r = r \begin{cases} n-r=r \rightarrow \boxed{x=\sqrt{r}} \\ n-r=-r \Rightarrow \boxed{x \leq 1} \end{cases}$$

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$$f(n) \rightarrow \text{ext} \mid r$$

$$y = 1 - r f(rn + r) \rightsquigarrow rn + r \leq 1 \rightarrow rn \leq -1 \Rightarrow n = -\frac{1}{r} \left\{ \begin{array}{l} A(-\frac{1}{r}, -\frac{v}{r}) \\ \alpha \quad \beta \end{array} \right. \rightarrow \alpha\beta = (-\frac{1}{r})(-\frac{v}{r}) = \frac{v}{r}$$

$$\hookrightarrow y = 1 - r \frac{f(1)}{r} \Rightarrow y = 1 - 1 = -v$$

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$$D_{f(n)} = (a, r] \rightarrow D_{f(n+1)} = (a+1, a]$$

$$D_{g(n)} = [-1, b) \rightarrow D_{g(n+1)} = [-r, b-1)$$

$$y = f(n-1) + g(n+1) \rightarrow D_y = (a+1, a] \cup [-r, b-1) = (-r, a) \rightarrow \begin{cases} a+1 = -r \Rightarrow a = -r \\ b-1 = a \Rightarrow b = r \end{cases} \left\{ \begin{array}{l} a-b = -r-r = -2r \\ a-b = -r-r = -2r \end{array} \right. \rightarrow \boxed{-2r}$$

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8

$$y_i = f(\frac{x}{r} + 1) \rightarrow D_y = [-r, a] \rightsquigarrow -r \leq x \leq a \Rightarrow -\frac{r}{r} \leq \frac{x}{r} \leq \frac{a}{r} \Rightarrow -1 \leq \frac{x}{r} + 1 \leq \frac{a}{r}$$

$$\hookrightarrow R_y = [-1, r] \Rightarrow -1 \leq f(n) \leq r \rightarrow -r \leq r f(n) \leq r \Rightarrow -a \leq r f(n) - r \leq 1 \rightarrow a \leq |r f(n) - r| \leq a \rightarrow \boxed{D_f = [-\frac{1}{r}, \frac{v}{r}]}$$

$$\circ \sqrt{|r f(n) - r|} \leq \sqrt{a} \rightsquigarrow R_f = [0, \sqrt{a}]$$

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9

$$f(n) = \left| \frac{n+1}{r_{n+1}} \right| \xrightarrow{\text{substitui}} \left| \frac{(n-r)+1}{r(n-r)+1} \right| \xrightarrow{\text{substitui}} g(n) = \left| \frac{(n-r)+1}{r(n-r)+1} \right| + 1 \rightarrow g(n) = \left| \frac{n-1}{r_{n-r}} \right| + 1$$

$$n + g(n) < 0 \rightarrow n + \left| \frac{n-1}{r_{n-r}} \right| + 1 < 0 \rightarrow n+1 < 0 \Rightarrow n < -1 \quad \textcircled{I}$$

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

$$\frac{r(n-\sqrt{r})(n+\sqrt{r})}{r_{n-r}} < 0 \quad \frac{-\sqrt{r}}{2} + \frac{\sqrt{r}}{2} - \frac{r}{2} + \frac{r}{2} \quad \textcircled{II} \quad \textcircled{I}, \textcircled{II} \Rightarrow n < -\sqrt{r} \Rightarrow \boxed{(-\infty, -\sqrt{r})}$$

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10