

الف) $f(n) = n^2 + 2n + 1 + 9n^2 - 4n + 1 + mn^2 + nm + mn$ اگر f ثابت باشد باید ضرایب n و n^2 صفر باشد.

$10n^2 + mn^2 = 0 \Rightarrow m = -10$ $+2n - 4n + nm = 0 \Rightarrow n = 4$

$g(n) = \{(4, -10)(4, p+1)(p+2, -1)(-9, p+k)\} \Rightarrow p+1 = -10 \Rightarrow p = -11$
 $(-9, -1)$ $p+k = -1 \Rightarrow -11+k = -1 \Rightarrow k = 10$
 $m+n+p+k = -10+4-11+10 = -7$

الف) $\frac{n-2}{n^2-2n-1} \geq 0$

$n^2-2n-1=0$ ($n=t$)

$t^2-2t-1=0$ $(t-4)(t+2)=0$ $D_f = (-2, +\infty) - \{2\}$

$t=n^2=4 \Rightarrow n=\pm 2$

$t=n^2=-2$ غلط

$2 \rightarrow$ ریشه منبج $-2 \rightarrow$ ریشه منبج

ب) $4-2[-n] \neq 0$

$4 \neq 2[-n] \Rightarrow [-n] \neq 2 \Rightarrow$

$-n \neq [2, 3] \Rightarrow n \neq (-3, -2]$

$D_f = R - (-3, -2]$

الف) $f(n) = \frac{\sqrt{n(n^2-1)}}{\sqrt{|n|+n}}$

$n(n-1)(n+1) \geq 0$ $\frac{-1 \ 0 \ 1}{-1 \ 1 \ -1 \ 1}$
 $[-1, 0] \cup [1, +\infty)$

$|n|+n > 0$ $R^+ \setminus 0$ $D_f = [1, +\infty)$

$(0, +\infty) \cap [-1, 0] \cup [1, +\infty) = [1, +\infty)$

ب) $f(n) = \frac{\sqrt{|n-2|-n^2}}{|n|-1}$

$|n-2|-n^2 \geq 0 \Rightarrow |n-2| \geq n^2$

$n^2=2-n \Rightarrow n^2+n-2=0 \Rightarrow n=-2$

$|n|-1 \neq 0$ $|n| \neq 1$ $n \neq \pm 1$ $[2, 1]$

$[2, 1] \cap (R - \{\pm 1\}) = [2, 1] - \{-1\} = D_f$

$||n-2|-1|-K \neq 0 \Rightarrow ||n-2|-1| \neq K \rightarrow |n-2|-1 \neq K \Rightarrow |n-2| \neq K+1$
 $|n-2|-1 \neq -K \Rightarrow |n-2| \neq -K+1$

$|n-2| \neq K+1 \rightarrow n-2 \neq K+1$ $n \neq K+3$

$\rightarrow n-2 \neq -K-1$ $n \neq -K+1$

$|n-2| \neq -K+1 \rightarrow n-2 \neq 1-K$ $n \neq -K+3$

$\rightarrow n-2 \neq K-1$ $n \neq K+1$

$K+1 = -K+1 \Rightarrow K=0$ غلط

$n \neq 3, 1$ درستی را با $n=2$ می بینیم

$K+1 = -K+3 \Rightarrow K=1$ غلط

$n \neq 4, 0, 2$

$\checkmark$ درستی را با $n=1$ می بینیم

$y = 2n - [n] \quad [-2, 2]$

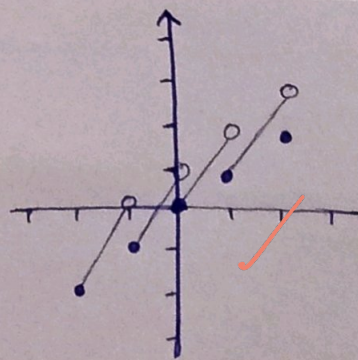
$[-2, -1) \rightarrow -2$ $2n+2$

$[-1, 0) \rightarrow -1$ $2n+1$

$[0, 1) \rightarrow 0$ $2n$

$[1, 2) \rightarrow 1$ $2n-1$

$2 \rightarrow 2$ $2n-2$



$$f(n) = \frac{n^r - rn + r}{n+a} + b \Rightarrow ! \text{سوال با جواب}$$

$$\frac{(n-1)(n-r)}{n+a} + b = n \rightarrow \textcircled{1} \underline{a=-1} \quad \frac{(n-1)(n-r)}{n-1} + b \Rightarrow n-r+b=n \quad \underline{b=r}$$

$$\rightarrow \textcircled{2} \underline{a=-r} \quad \frac{(n-1)(n-r)}{n-r} + b \Rightarrow n-1+b=n \quad \underline{b=1}$$

$$\underline{a-b = -r}$$

$$f(n) = \begin{cases} \frac{n^r + rn^r - n - r}{n^r - 1} & n \neq \pm 1 \\ \frac{an+r}{n+b} & n = \pm 1 \end{cases} \quad \begin{matrix} \frac{n^r + rn^r - n - r}{-n^r + n} \cdot \frac{n^r - 1}{n^r + r} \\ \frac{rn^r - r}{-rn^r + r} \end{matrix} \quad g(n) = n+r \quad (c=r)$$

$$\left. \begin{aligned} g(1) = r \quad \frac{a+r}{1+b} = r \quad a+r = r+rb \Rightarrow rb - a = -1 \\ g(-1) = 1 \quad \frac{-a+r}{-1+b} = 1 \quad -a+r = -1+b \Rightarrow b+a = r \end{aligned} \right\} \text{if } b=r \Rightarrow \underline{b=\frac{1}{r}}$$

$$b+c = \frac{1}{r} + r = \textcircled{r, \omega}$$

$$f(m) = \sqrt{\varepsilon m - r\alpha} + K-1 \quad g(m) = \sqrt{b - \varepsilon m + rK} \quad rf - g = \{(1, K)\}$$

$$Df \cap g = \{1\} \quad \varepsilon m - r\alpha \geq 0 \Rightarrow \varepsilon m \geq r\alpha \Rightarrow m \geq \frac{r\alpha}{\varepsilon} \quad \frac{r\alpha}{\varepsilon} = 1 \Rightarrow \underline{a = \frac{r}{\varepsilon}}$$

$$b - \varepsilon m \geq 0 \Rightarrow b \geq \varepsilon m \Rightarrow \frac{b}{\varepsilon} \geq m \quad \frac{b}{\varepsilon} = 1 \Rightarrow \underline{b = r}$$

$$rf(1) - g(1) = rK - r - rK = K \Rightarrow -K - r = K \Rightarrow \underline{K = -1}$$

$$r\alpha - \frac{b}{r} - K = r - \frac{r}{r} + 1 = r$$

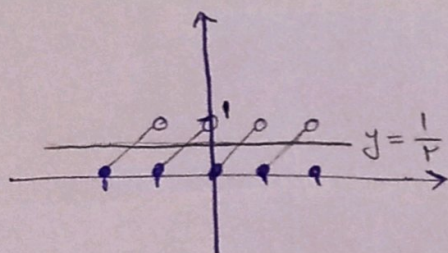
$$g(m) = \sqrt{rm+r} \quad f(m) = \sqrt{m-n} + n \quad Df \cap g = \{-1, v\}$$

$$rm+r \geq 0 \quad n \geq -1 \quad m-n \geq 0 \quad m \geq n \Rightarrow m=v \quad f(n) = \sqrt{v-n} + n$$

$$f(r) - g(r) = r+n-\sqrt{n} = r+n-r\sqrt{r} = 4\sqrt{r} \Rightarrow n = 4\sqrt{r} - r$$

$$m+n = v + 4\sqrt{r} - r = \omega + 4\sqrt{r}$$

$$y = (-1)^r (n - [r]) = \frac{1}{r} \Rightarrow y = (n - [r]) = \frac{1}{r} \quad \{r, r\}$$



سوال با جواب