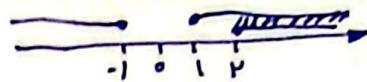


الف) $y = \sqrt{m^2 - 1} + \sqrt{m - 2}$



$m - 2 \geq 0 \rightarrow m \geq 2$
 $m^2 - 1 \geq 0 \rightarrow m^2 \geq 1 \rightarrow m \geq 1 \text{ or } m \leq -1$

$\rightarrow \frac{\sqrt{4-3m}}{\sqrt{4m-3}} \rightarrow 4-3m \geq 0 \rightarrow 2 \geq \frac{3}{4}m \rightarrow 2 \geq m$
 $4m-3 \geq 0 \rightarrow 4m \geq 3 \rightarrow m \geq \frac{3}{4}$

6

چون در اعشاری فقط یک
 عضو داشته باشیم پس
 می هر دو عبارت در اعشاری منفرد شود

$4m - 4 = 0 \rightarrow 4m = 4 \rightarrow m = 1$
 $b - 2m = 0 \rightarrow m = 2 \rightarrow b - 4 = 0 \rightarrow b = 4$
 $\frac{b}{a} = \frac{4}{12} = \frac{1}{3}$

7

الف) $y = \sqrt{\frac{m^2 - m - 4}{m^2 - 13m + 42}} \Rightarrow m^2 - m - 4 = 0 \rightarrow (m - 3)(m + 2) = 0 \rightarrow m = 3, -2$
 $t = m^2 \rightarrow t^2 - 13t + 42 = 0 \rightarrow (t - 6)(t - 7) = 0 \Rightarrow t = 6, 7 \rightarrow m = \pm 2, \pm 3$

$\frac{-2}{+} \frac{+3}{-} \frac{-3}{+} \frac{+2}{-}$
 $\frac{m^2 - 13m + 42}{m^2 - 13m + 42}$

$D_f: (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$

آوردیم چند عددی جمع فرایند منفرد باشد بر $m = 1$
 زوج و فرد برابر باشد بر $m + 1$ یعنی پذیر است

$\frac{-3}{+} \frac{-2}{-} \frac{-1}{+} \frac{1}{-} \frac{2}{+} \frac{3}{-}$
 $D_f: (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$

8

الف) $y = \sqrt{2[m] - 5} - 2[m] - 4 \geq 0 \rightarrow [m] \geq 2$
 $D_f: [2, +\infty)$

ب) $y = \sqrt{2[m] - 4} - 2[m] - 4 \geq 0 \rightarrow [m] \geq 2, \infty$
 $D_f: [3, +\infty)$

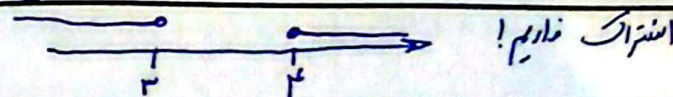
9

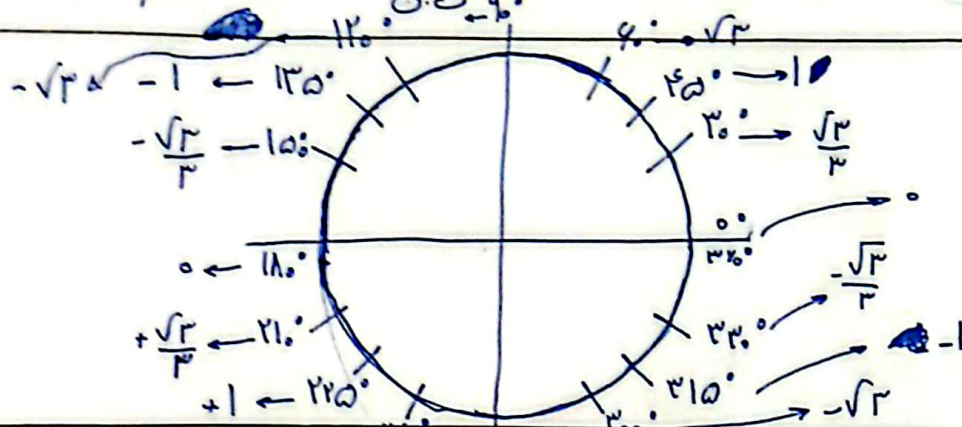
الف) $y = \sqrt{\frac{m+1}{|m-2|}} + \sqrt{\frac{4-m}{m^2+2m+5}} \rightarrow D_f: [-1, 4] - \{3\}$

لح صوابه مثبت دور
 $n = 3$ برابر منفرد است
 $m > -1$ و $m \neq 3$
 $\Delta < 0$ جواب ندارد
 ریشه ندارد و صوابه مثبت است
 $\Delta > 0$

ب) $y = \sqrt{[m] - 4} + \sqrt{2 - [m]} \rightarrow [m] - 4 \geq 0 \rightarrow [m] \geq 4 \rightarrow m \geq 4$
 $2 - [m] \geq 0 \rightarrow 2 \geq [m] \rightarrow 3 > m$
 $D_f: \emptyset$

10





tan

الف) $\sin \frac{\pi}{6} + \cos \frac{\pi}{3} + \tan \frac{\pi}{4} = \frac{1}{2} - 1 + 1 = \frac{1}{2}$

ب) $-\cos \frac{\pi}{6} + \sin \frac{\pi}{3} - 2 \sin \frac{\pi}{4} = -\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 2\left(\frac{\sqrt{2}}{2}\right) = -\sqrt{2}$

ج) $\cot \frac{\pi}{6} + 2 \cot \frac{\pi}{3} - \tan \frac{\pi}{4} = -\frac{\sqrt{3}}{3} + 2\left(\frac{\sqrt{3}}{3}\right) - 1 = \frac{\sqrt{3}}{3}$

د) $\cos(\sin \frac{\pi}{2}) + \sin(\pi \cos \frac{\pi}{3}) = \cos(1) + \sin(\frac{\pi}{2}) = 1 + 1 = 2$

$f(n) = \begin{cases} n^2 + 2n & n \geq a \\ 2n + a + 2 & n \leq a \end{cases} \xrightarrow{n=a} a^2 + 2a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0$
 $(a+2)(a-1) = 0 \rightarrow a = -2 \text{ or } a = 1$
 $a = 1$

$f(1) = ?$

$f(n) = \begin{cases} n^2 + 2n & n \geq 1 \\ 2n + 3 & n \leq 1 \end{cases} \xrightarrow{n=1} f(1) = 3$

$f(n) = \begin{cases} 2n^2 - b & |n+1| \geq 2 \\ a + 2n & -3 \leq n \leq -1 \end{cases}$
 $|n+1| \geq 2 \rightarrow n+1 \geq 2 \rightarrow n \geq 1$
 $|n+1| \geq 2 \rightarrow n+1 \leq -2 \rightarrow n \leq -3$

$n = -3 \rightarrow 1 - b = a - 2 \rightarrow a + b = 3$

الف) $\frac{1}{n^3 - 2n^2} \rightarrow n^3 - 2n^2 \neq 0 \rightarrow n^2(n-2) \neq 0 \rightarrow n \neq 0, 2$
 $D_f: \mathbb{R} - \{0, 2\}$

ب) $\frac{1}{2n^3 + 2n^2 + 2n + 2} \rightarrow 2n^3 + 2n^2 + 2n + 2 \neq 0 \rightarrow 2n^2(n+1) + 2(n+1) \neq 0$
 $(n+1)(2n^2 + 2) \neq 0 \rightarrow n+1 \neq 0 \rightarrow n \neq -1$
 $2n^2 + 2 = 0 \rightarrow 2(n^2 + 1) = 0 \rightarrow n^2 + 1 = 0 \rightarrow n^2 = -1$
 $D_f: \mathbb{R} - \{-1\}$

همواره مثبت است و صفر نمی شود