

Mo Tu We Th Fr Sa Su

کتاب مسعودی

$$1) \quad 3y-1=x \Rightarrow y = \frac{x+1}{3}$$

$$\hookrightarrow y \geq 0 \Rightarrow x \geq -1 \quad \checkmark \text{ تابع است}$$

$$-y^2 = x \Rightarrow y = \pm \sqrt{-x}$$

$$y > 1 \Rightarrow x < -1$$

$$2) \quad x=0, f(x-2) = -2, 3, 7$$

$$\hookrightarrow -\{6\}$$

$$f(x) = -4, 3, 5$$

$$\hookrightarrow -\{4\}$$

$$\begin{array}{ccccccccc} -4 & -2 & 0 & 3 & 5^* & & & & \\ - & + & - & + & - & + & - & + & \end{array}$$

$$D = (-4, -2] \cup [0, 3) \cup$$

$$[7, +\infty)$$

$$3) \quad f(x) = \frac{2x^2 - 3x + 2}{x^3 - 4x} \rightarrow \text{نسبت}$$

$$\begin{array}{ccc} -2 & 0 & 2 \\ - & + & - & + \end{array}$$

$$\text{الف) } R = \{0, 2, -2\}$$

$$\hookrightarrow x(x-2)(x+2)$$

$$\text{ب) } \frac{2x^2 - 3x + 2}{x(x-2)(x+2)} \geq 0 \quad D_f = (-2, 0) \cup (2, +\infty)$$

$$4) \quad \text{الف) } \frac{x-2}{x^4 - 2x^2 - 8} \geq 0 \xrightarrow{x^2=t} t^2 - 4t - 8 = 0 \quad \sqrt{\quad} \Rightarrow t = 4, -2$$

$$(t-4)(t+2) = 0$$

$$x = \pm 2$$

$$\begin{array}{ccc} 2 & 2 & \\ - & + & + \end{array}$$

$$D_f = (-2, +\infty) - \{2\} \quad \boxed{-3 < x \leq -2}$$

$$4 - 2[-x] = 0 \Rightarrow x = [-x] \Rightarrow -2 \leq x < 3$$

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$$\text{ب) } \frac{2x^2 + 1}{4 - 2[-x]}$$

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5)

الف)

$$\frac{\sqrt{n(n-1)(n+1)}}{\sqrt{|n|+n}} \rightarrow \geq 0$$

$$\begin{array}{ccc} -1 & 0 & 1 \\ -1 & + & -1 & + \end{array}$$

$$\Rightarrow D_f = [1, +\infty)$$

$$\hookrightarrow (+) \rightarrow 2n \Rightarrow \frac{1}{2}(0, +\infty)$$

ب)

$$\sqrt{|n-2|} - n^2$$

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

$$|n| - 1$$

$$\hookrightarrow |n| \neq 1 \Rightarrow n \neq 1, -1$$

$$\begin{array}{c|c} -n^2 - n + 2 \geq 0 & -n^2 + n - 2 \geq 0 \end{array}$$

$$D_f = [-2, 1) \cup \{1\}$$

$$n^2 - n + 2 \leq 0$$

$$n^2 + n - 2 \leq 0$$

$$(n+2)(n-1) \leq 0$$

6)

الف)

$$\begin{array}{ccc} 2 & 3 & \\ + & | & 0 & | & + \end{array}$$

$$D_f = \mathbb{R}_1$$

ب)

$$\begin{array}{ccc} 3 & 4 & \\ - & | & - & | & 0 & | & + \end{array}$$

$$D_f = [3, +\infty) \cup \{1\}$$

7)

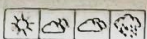
$$|n-2| = k+1 \Rightarrow k+1 > 0 \rightarrow k \geq -1$$

$$|n-2| = -k+1 \Rightarrow -k+1 > 0 \rightarrow k \leq 1$$

$$\left. \begin{array}{l} k \geq -1 \\ k \leq 1 \end{array} \right\} -1 \leq k \leq 1$$

$$|n-2|-1 = k \Rightarrow$$

$$k > 0 \rightarrow \boxed{k=1}$$



8)

$$f(n) = \frac{n^2}{n^2 + 3n + 2}$$

$$n^2 + 3n + 2 \rightarrow \neq 0$$

$$n+1 \rightarrow \neq 0$$

$$n-1 \rightarrow \neq 0$$

$$(n+1)(n+2) \Rightarrow n \neq -1, -2$$

$$\Rightarrow n \neq -1$$

$$n \neq 1$$

$$\Rightarrow n = 3$$

$$n^2 - 6n + 9 = 0 \Leftrightarrow (n-3)^2 = 0 \Rightarrow n = 3 \quad \text{sim (1)}$$

9)

$$\log_{\frac{1}{2}} n \rightarrow n \neq 1, n > 0$$

$$n+1 \rightarrow n+1 > 0 \rightarrow n > -1$$

$$n \neq 0$$

$$D_f = (0, 1)$$

$$\log_{\frac{1}{2}} n > 0 \Rightarrow \begin{cases} n > 1 \rightarrow \log_{\frac{1}{2}} n > 0 \rightarrow \frac{1}{2} > 1 \times \\ 0 < n < 1 \rightarrow \log_{\frac{1}{2}} n < 0 \rightarrow \frac{1}{2} < 1 \checkmark \end{cases}$$

$$0 < n < 1 \rightarrow \log_{\frac{1}{2}} n < 0 \rightarrow \frac{1}{2} < 1 \checkmark$$

$$10) f(n) = \sqrt{-(n+5)(n-3)} \xrightarrow{n-3n^2-1} \sqrt{-(3n^2+4(3n^2-4))}$$

$$3n^2 = 4 \rightarrow n^2 = \frac{4}{3} \Rightarrow n = \pm \frac{2}{\sqrt{3}}$$

$$-\frac{2}{\sqrt{3}} \quad + \frac{2}{\sqrt{3}}$$

$$- \quad + \quad -$$

$$D_f = \left[-\frac{2}{\sqrt{3}}, \frac{2}{\sqrt{3}} \right]$$