

$$f(x) = \sqrt{(a-2)x^2 + ax + b}$$

$$a=2$$

$$14, 15$$

$$(a-2)x^2 + ax + b = 0$$

$$12a + b - 11 = 0$$

$$\Rightarrow b = 11 - \frac{12a}{1}$$

$$-\frac{b}{12a} = 2 \Rightarrow \frac{-a}{12a-1} = 2 \Rightarrow a = \frac{12}{11}$$

$$b = -\frac{11}{11}$$



باید یک خط باریک صفت باشد!

$$f(x) = \sqrt{x^2 + 2x + 2 - m^2} \Rightarrow \sqrt{(x+1)^2 - m^2}$$

$$x=0 \Rightarrow m=1$$

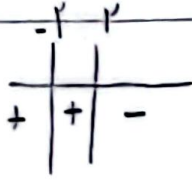
$$1 - m^2 \geq 0$$

$$m = -1$$

$$m = 1$$

(2)

$$f(x) = \sqrt{1 - x^2} \Rightarrow x = 1, x = -1$$



$$D = [-1, 1]$$

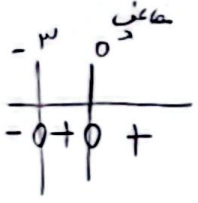
(3)

$$x \in \mathbb{Z} \Rightarrow \text{مخرج} = 1$$

$$[x] + [-x] = 0$$

اعداد 2 و 3 و 4 و 5 و 6 و 7 و 8 و 9 و 10 و 11 و 12 و 13 و 14 و 15 و 16 و 17 و 18 و 19 و 20 و 21 و 22 و 23 و 24 و 25 و 26 و 27 و 28 و 29 و 30 و 31 و 32 و 33 و 34 و 35 و 36 و 37 و 38 و 39 و 40 و 41 و 42 و 43 و 44 و 45 و 46 و 47 و 48 و 49 و 50 و 51 و 52 و 53 و 54 و 55 و 56 و 57 و 58 و 59 و 60 و 61 و 62 و 63 و 64 و 65 و 66 و 67 و 68 و 69 و 70 و 71 و 72 و 73 و 74 و 75 و 76 و 77 و 78 و 79 و 80 و 81 و 82 و 83 و 84 و 85 و 86 و 87 و 88 و 89 و 90 و 91 و 92 و 93 و 94 و 95 و 96 و 97 و 98 و 99 و 100

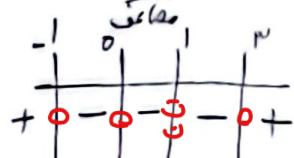
$$y = \sqrt{x^3 + 3x^2} \Rightarrow \sqrt{x^2(x+3)}$$



$$x=0, x=-3$$

$$D = [-3, +\infty)$$

$$y = \sqrt{\frac{(x^2-1)(x^3-3x^2)}{x^3-1}} \Rightarrow x(x-3)$$



$$D_f = ?$$

$$D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)$$

(4)

$$y = \sqrt{|x-2| - 3}$$

$$|x-2| - 3 \geq 0$$

$$|x-2| \geq 3$$

$$x-2 \geq 3 \Rightarrow x \geq 5$$

$$x-2 \leq -3 \Rightarrow x \leq -1$$

$$D_f = (-\infty, -1] \cup [5, +\infty)$$

$$y = \sqrt{4 - |2-x|}$$

$$|2-x| \leq 4$$

$$-4 \leq 2-x \leq 4$$

$$-2 \leq x \leq 6$$

(5)

الف) $\sqrt{1-x|x|}$

$\hookrightarrow x|x| \leq 1$

$\hookrightarrow \begin{cases} x < 0 \\ x > 0 \end{cases} \begin{cases} x|x| = - \\ x|x| = + \end{cases} \Rightarrow D_f = (-\infty, 1]$

$\hookrightarrow x > 1 \Rightarrow x|x| = +x$ ✓

ب) $\frac{1}{\sqrt{r^2 - |x - \omega| - 1}}$

$r^2 - |x - \omega| \geq 0$

$|x - \omega| \leq r^2$

$r \leq x \leq 1$

$|x - \omega| = r^2$

$x - \omega = r^2 \rightarrow x = \omega + r^2$

$x - \omega = -r^2 \rightarrow x = \omega - r^2$

$D = [r, 1] - \{r, \omega\}$

الف) $y = \frac{\sin^r x - 1}{\cos x}$

$\cos x \neq 0$

$D = \mathbb{R} - \left\{ \frac{k\pi}{r} + k\pi \right\}$ ✓

ب) $\frac{\sin^r x - 1}{r \cos x - 1}$

$\cos x \neq \frac{1}{r}$

$\mathbb{R} - \left\{ r k \pi \pm \frac{\pi}{r} \right\}$

الف) $y = \frac{x+r}{|rx+1| + |x+r|}$

$rx+1 = x+r \rightarrow x=r$

$rx+1 = -x-r \rightarrow x = -\frac{r}{r}$

$\mathbb{R} - \left\{ -\frac{r}{r}, r \right\}$ ✓

ب) $|rx+1| \geq |x+r|$

$rx^2 + rx + 1 \geq x^2 + rx + r$

$rx^2 - rx - 1 \geq 0$

$(rx+1)(x-r) \geq 0$

$\downarrow \quad \downarrow$

$x = -\frac{1}{r} \quad x = r$

Sign chart: $\begin{array}{c|c|c} -\frac{1}{r} & & r \\ \hline + & - & + \end{array}$

$f(x) = \sqrt{\log_{\omega} \log_{\omega} (rx-1)}$

$\log_{\omega} \log_{\omega} (rx-1) \geq 0$

$0 \leq \log_{\omega} (rx-1) \leq 1$

$rx-1 \leq \omega^1$

$x \leq r$

$D_f = (1, r]$ ✓

الف) $\log(r \cos x + 1)$

$r \cos x + 1 > 0$

$\cos x > -\frac{1}{r}$

$D_f = \left[r k \pi - \frac{r\pi}{r}, r k \pi + \frac{r\pi}{r} \right]$

ب) $y = \sqrt{\log \left(\frac{x-1}{x+1} \right)}$

$\frac{x-1}{x+1} \geq 1$

$\frac{x-1-x-1}{x+1} \geq 0 \Rightarrow \frac{-2}{x+1} \geq 0$

$D_f = (-\infty, -1)$

(۱) چون دامنه تک بازه است پس عبارت نمی تواند یک سهم باشد و باید یک خط باشد!

$$a - 2 = 0 \rightarrow a = 2 \rightarrow f(x) = \sqrt{2x + b} \quad D_f = [3, +\infty) \rightarrow 2(3) + b = 0 \rightarrow \boxed{b = -6}$$

۴- ب) $\frac{(x^2-1)(x^3-x^2)}{(x^3-1)} \geq 0 \rightarrow \frac{(x-1)(x+1)(x^2)(x-1)}{(x-1)(x^2+x+1)} \geq 0$

$D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)$

Δ ∞ همیشه ندارد

Sign chart: $\begin{array}{ccccccc} & -1 & 0 & 1 & 3 & & \\ & + & - & - & - & + & \\ & + & - & - & - & + & \end{array}$

الف - ۵) $2 \cdot \sin + 1 > 0 \rightarrow \sin > -\frac{1}{2}$

$D_f = (2k\pi - \frac{\pi}{2}, 2k\pi + \frac{\pi}{2})$

