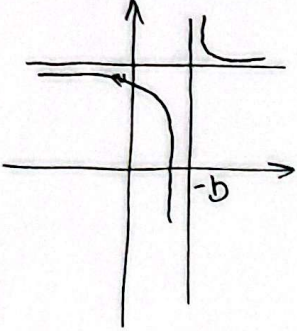


الف) تابع هست ✓
 ب) $y = kx + \frac{a}{x}$ و $x = \frac{a}{y}$ ← یابونیست
 ج) $\frac{x+y}{x-y} = \sqrt{xy} \Rightarrow x+y = \sqrt{xy}(x-y) \Rightarrow x^2 + y^2 + 2xy = (x-y)^2 = x^2 + y^2 - 2xy \Rightarrow 4xy = 0 \Rightarrow x=0$ یا $y=0$ → تابع هست
 د) $\frac{x+y}{x-y} = \sqrt{xy} \Rightarrow x+y = \sqrt{xy}(x-y) \Rightarrow x^2 + y^2 + 2xy = (x-y)^2 = x^2 + y^2 - 2xy \Rightarrow 4xy = 0 \Rightarrow x=0$ یا $y=0$ → تابع هست

$D_f \Rightarrow -x^2 - bx + a \geq 0 \quad D_f = [b, a] \quad \frac{b}{-1} \frac{a}{-1} \Rightarrow$
 $-b^2 - b^2 + a = 0 \Rightarrow a = 2b^2$, $-a^2 - ba + a = 0 \Rightarrow -a(a+b-1) = 0$
 $\Rightarrow (-2b^2)(2b^2 + b - 1) = 0 \Rightarrow \begin{cases} b=0 \Rightarrow a=0 \\ 2b^2 + b - 1 = 0 \Rightarrow b = \frac{1}{2} \Rightarrow a = \frac{1}{2} \Rightarrow a+b=1 \\ b = -1 \Rightarrow a = 2 \Rightarrow a+b=1 \end{cases}$ ✓

$\frac{1}{x-1} = \frac{a}{x-1} \Rightarrow \begin{cases} a=0 \\ b \neq 0 \end{cases} \Rightarrow b \neq 0$, $C = -2b$
 $ca + C - mb = 0 \Rightarrow (-2b) + (-2(-b)) = 0 \Rightarrow 0 = 0$ ✓

$\frac{1}{|n| - [n]} > 0 \Rightarrow |n| - [n] > 0 \Rightarrow \begin{cases} n - [n] > 0 \quad (n > 0) \Rightarrow n > [n] \Rightarrow n \neq \mathbb{Z}^+ \\ -n - [n] > 0 \quad (n < 0) \Rightarrow -n > [n] \Rightarrow \checkmark \end{cases}$
 $D_f = \mathbb{R} - \mathbb{Z}^+ - \{0\}$ ✓
 $a - \sqrt{n} = \sqrt{y} \Rightarrow \frac{1}{1 - \sqrt{n}} + n = y \Rightarrow n \geq 0 \quad D_f = [0, +\infty)$
 $a - \sqrt{n} \geq 0 \Rightarrow \sqrt{n} \leq a \Rightarrow n \leq a^2$
 $D_f = [0, a^2]$

$\log_{x-1} x$ $\begin{cases} x > 0 \\ x \neq 1 \\ x-1 > 0 \Rightarrow x > 1 \\ \log_{x-1} x \geq 0 \Rightarrow x-1 \geq x \Rightarrow x \leq \frac{1}{x} \end{cases}$ $0 < x-1 \leq x^0 \rightarrow x \leq \frac{1}{x}$ $D_f = \left(\frac{1}{x}, \frac{1}{x}\right] \cup (1, +\infty)$ $D_f = \left[\frac{1}{x}, +\infty\right)$	6
$7 + \sqrt{ x } - x > 0 \Rightarrow (\sqrt{ x } = t) \Rightarrow -t^2 + t + 7 > 0 \Rightarrow \frac{-1 \pm \sqrt{1+28}}{-2} < t < \frac{-1 + \sqrt{29}}{-2}$ $-2 < t < 2 \Rightarrow \sqrt{ x } > -2 \checkmark$ $t < 2 \Rightarrow \sqrt{ x } < 2 \Rightarrow x < 4 \Rightarrow x < 4 \checkmark$	7
 $\frac{2x+2}{x+b} \Rightarrow \begin{cases} a = -2 \\ b = -2 \end{cases}$	8
$[x] > x \Rightarrow x \geq 0 \quad [x] \leq x \Rightarrow x < 0$ $f(x) \geq x-1 \Rightarrow x-1 \geq x-1 \quad (x \geq 0) \Rightarrow x \geq 0 \checkmark$ $f(x) \geq x-1 \Rightarrow x+2 \geq x-1 \quad (x < 0) \Rightarrow x \geq -3 \Rightarrow x \geq -\frac{3}{x}$ $D_f = \left[-\frac{3}{x}, +\infty\right) \checkmark$	9
$\frac{x(17x^2 + 12x^2 + 7x + 1)}{(x+1)^2} = \frac{x}{x+1}$ $D_{y, R} = \left\{-\frac{1}{x}\right\}$	10
$\log_{10} x < 1 \Rightarrow x-1 < 10 \quad x < 10 \quad , x-1 > 0 \Rightarrow x > 1$ $a < x < a+10 \Rightarrow \frac{a}{x} < x < \frac{a+10}{x} \Rightarrow C-b : \frac{a+10-a}{x} = \frac{10}{x}$ $D_f = \left(\frac{a}{x}, \frac{a+10}{x}\right]$	11