

دوم (فرضان)

تلفیق و

عسل، صفائی

الف) $y = \frac{x+y}{x^2 - 10x^2 + 10x - 10} \Rightarrow y^2 - 10y + 10x - 10 = 0 \Rightarrow y^2 - 10y + 10x - 10 = 0$

ب) $x \neq 1, \frac{0}{y}, \frac{y}{x} \Rightarrow D_f = \mathbb{R} - \left\{1, \frac{0}{y}, \frac{y}{x}\right\} \quad (x-1)(y^2 - 10y + 10) = 0$

ب) $y = \frac{x+y}{x^2 - 10x^2 - 10x - 10} \Rightarrow y^2 - 10y - 10x - 10 = 0 \Rightarrow y^2 - 10y - 10x - 10 = 0$

$x^2 - 10x - 10 \neq 0 \Rightarrow x^2 - 10x - 10 \neq 0 \Rightarrow (x-5)(x+2) \neq 0$
 $D_f = \mathbb{R} - \left\{1, y, -\frac{y}{x}\right\}$

الف) $y = \frac{x+1}{x - \sqrt{y^2 - 10x}} \Rightarrow x \leq \frac{y}{x} \Rightarrow x - \sqrt{y^2 - 10x} \neq 0 \Rightarrow x \neq \sqrt{y^2 - 10x} \Rightarrow x^2 \neq y^2 - 10x$

$x^2 + 10x - y^2 \neq 0 \Rightarrow (x+y)(x-1) \neq 0 \Rightarrow D_f = (-\infty, \frac{y}{x}] - \{1, -y\}$

ب) $y = \frac{x+y}{x - \sqrt{y^2 - 10x}} \Rightarrow x - \sqrt{y^2 - 10x} \neq 0 \Rightarrow x \neq \sqrt{y^2 - 10x} \Rightarrow x^2 \neq y^2 - 10x$
 $x^2 - 10x + 10 \neq 0 \Rightarrow (x-1)(x-10) \neq 0 \Rightarrow D_f = \left[\frac{y}{x}, +\infty\right) - \{1, y\}$

الف) $y = \frac{\sin x}{y \cos x - 1} \Rightarrow y \cos x - 1 \neq 0 \Rightarrow y \cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{y}$
 $\Rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{y}, yk\pi + \frac{0\pi}{y}\right\}$

ب) $y = \frac{\cos x + 1}{y \sin x + 1} \Rightarrow y \sin x + 1 \neq 0 \Rightarrow \sin x \neq -\frac{1}{y} \Rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{y\pi}{y}, yk\pi + \frac{11\pi}{y}\right\}$

ج) $y = \frac{\tan x + y}{\cot x - 1} \Rightarrow \cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{y}, \frac{k\pi}{y}\right\}$

د) $y = \frac{\sinh x + 1}{y \sin x - y} \Rightarrow y \sin x - y \neq 0 \Rightarrow \sin x \neq \frac{y}{y} \Rightarrow \sin x \neq \pm \frac{y}{y} \Rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{y}, k\pi + \frac{y\pi}{y}\right\}$

$$الف) x^y - \omega x + y > 0 \Rightarrow (x - y^y)(x - y) > 0$$

$$D_f = (-\infty, y) \cup (y^y, +\infty)$$

$$ب) x^y - yx + \omega < 0 \Rightarrow (x - 1)(x - \omega) < 0 \quad + \frac{1}{\omega} - \frac{1}{y} +$$

$$D_f = (1, \omega)$$

$$ج) x^y + yx + \omega > 0 \Rightarrow (x + 1)(x + \omega) > 0 \quad + \frac{-\omega - 1}{y} +$$

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

$$د) x^y - yx + y \leq 0 \Rightarrow (x - 1)(x - y) \leq 0$$

$$D_f = [1, y]$$

$$الف) \frac{x^y - yx + y}{x - \omega} < 0 \Rightarrow \frac{(x - 1)(x - y^y)}{x - \omega} < 0 \quad + \frac{1}{y} - \frac{1}{\omega} +$$

$$D_f = (-\infty, 1) \cup (y, \omega)$$

$$ب) \frac{x^y - 1}{x^y - yx + \omega} > 0 \Rightarrow \frac{(x - 1)(x + 1)}{(x - 1)(x - \omega)} > 0 \quad + \frac{-1}{y} - \frac{1}{\omega} +$$

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

$$الف) y = \frac{x^y - y^y x + y^y}{x^y - 1} = \frac{(x - 1)(x - y^y)}{(x - 1)(x^y + 1 + x)} \quad + \frac{1}{y} - \frac{1}{y^y} +$$

$$D_f = [y^y, +\infty)$$

$$ب) y = \frac{x^y - y^y x + y^y}{x^y - 1} \Rightarrow x^y - 1 \neq 0 \Rightarrow (x - 1)(x + 1) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1, -1\}$$

$$الف) y \log(x^y - y^y x) \rightarrow x^y - y^y x > 0 \Rightarrow x(x - y^y) > 0 \Rightarrow D_f = (-\infty, 0) \cup (y^y, +\infty)$$

$$+ \frac{0}{y} - \frac{1}{y} +$$

$$ب) y = \log |y - x^y| \Rightarrow |y - x^y| > 0 \Rightarrow (y^y - x)(y^y + x) > 0 \Rightarrow \frac{-y^y}{y} + \frac{y^y}{y} =$$

$$(I)$$

$$خ) |x - y| \neq 1 \Rightarrow |x| \neq y^y \Rightarrow x \neq y^y, -y^y \quad (III) \quad D_f = (I) \cap (II) \cap (III) = (-y^y, -y^y) \cup (y^y, y^y) - \{y^y, -y^y\}$$

$$ج) y \log \frac{x^y - y^y x + 1}{x - y^y} \rightarrow \frac{x^y - y^y x + 1}{x - y^y} > 0 \Rightarrow \frac{(x - y^y)(x - y^y)}{x - y^y} > 0 \Rightarrow \frac{-1}{y^y} + \frac{y^y}{y^y} =$$

$$+ \frac{-1}{y^y} + \frac{y^y}{y^y}$$

$$D_f = (y^y, 10) - \{9\}$$

$$د) y = \sqrt{x - 1} \log x + y \log \sqrt{y - x^y} \rightarrow \sqrt{(y - x)(y - x)} > 0 \Rightarrow x \neq \pm y \quad (III)$$

$$خ) (x - y)(x - y^y) > 0 \quad x > 0 \quad (II) \quad (y - x)(y + x) > 0 \rightarrow \frac{-y}{y} + \frac{y}{y} =$$

$$(V)$$

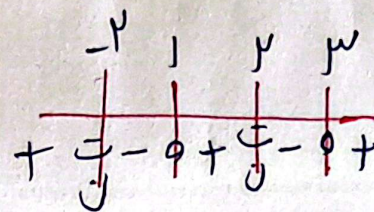
$$D_f = (I) \cap (II) \cap (III) \cap (IV) \cap (V) = (0, y^y] - \{1\} \quad (I)$$

$$\frac{(1+x)x}{(1-x)x}$$

$$\begin{array}{cccc|c} 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \end{array}$$
[illegible] $\angle$

$$y = \sqrt{\frac{x - f(x)}{f(x)}} \rightarrow \frac{x - f(x)}{f(x)} \geq 0$$

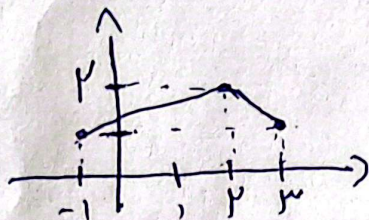
ریشه های تابع $f(x) = 0$, $f(x) = x \rightarrow -2, 1, 2, 3$



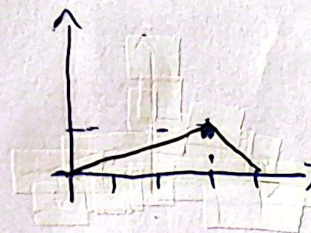
$$D_f = (-\infty, -2) \cup [-1, 2) \cup [3, +\infty)$$

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الف)

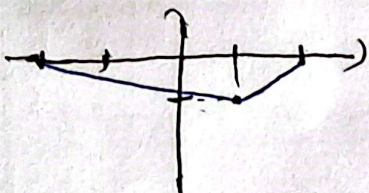


ب)



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ج)



د)

