

دوم (مضربان)

تلفیق و

عسل، صفائی ۱۸/۲۵

الف) $y = \frac{x+y}{x^2 - 10x^2 + 11x - 10} \Rightarrow y^2 - 10y + 11y - 10 = 0 \Rightarrow y^2 - 10x^2 + 11x - 10 = 0$

ب) $x \neq 1, \frac{0}{y}, \frac{y}{y} \Rightarrow D_f = \mathbb{R} - \left\{1, \frac{0}{y}, \frac{y}{y}\right\} \Rightarrow (x-1)(y^2 - 10x^2 + 11x - 10) \neq 0$

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$y^2 - 10x^2 + 11x - 10 = 0 \Rightarrow x^2 - 10x^2 + 11x - 10 = 0 \Rightarrow (x-1)(x+y) \neq 0$

$x \neq \frac{y}{y}, x \neq \frac{y}{y}$

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

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

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$x^2 - 10x^2 + 11x - 10 \neq 0 \Rightarrow (x-1)(x-y) \neq 0 \Rightarrow D_f = \left[\frac{y}{y}, +\infty\right) - \{1, y\}$

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

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

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

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

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

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

$$ج) x^y + yx + \omega > 0 \Rightarrow (x+1)(x+\omega) > 0$$

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

$$د) x^y - \sqrt{x} + y \leq 0 \Rightarrow (x-1)(x-y) \leq 0$$

$$D_f = [1, y]$$

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

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

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

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

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

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

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

$$الف) y \log(x^y - y^y x) \rightarrow x^y - y^y x > 0 \Rightarrow x(x - y^y) > 0$$

$$D_f = (-\infty, 0) \cup (y^y, +\infty)$$

$$ب) y = \log(14 - x^y) \Rightarrow 14 - x^y > 0 \Rightarrow (14 - x)(14 + x) > 0$$

$$D_f = (-14, 14)$$

$$خ) |x-1| \neq 1 \Rightarrow |x| \neq y^y \Rightarrow x \neq y^y, -y^y$$

$$D_f = (I) \cap (II) \cap (III) = (-y^y, -1) \cup (1, y^y) - \{y^y, -y^y\}$$

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

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

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

$$د) y = \sqrt{x - 11x + 14} + \log \sqrt{4 - x^y} \Rightarrow \sqrt{(x-1)(x-14)} > 0 \Rightarrow x \neq \pm 1$$

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

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

Handwritten multiplication table for GF(2^4) using the polynomial $x^4 + x + 1$. The table shows the result of multiplying elements x^0 through x^3 . Red markings indicate the reduction step where x^4 is replaced by $x+1$.

	x^0	x^1	x^2	x^3
x^0	x^0	x^1	x^2	x^3
x^1	x^1	x^2	x^3	$x^4 = x+1$
x^2	x^2	x^3	$x^4 = x+1$	$x^5 = x^2+x+1$
x^3	x^3	$x^4 = x+1$	$x^5 = x^2+x+1$	$x^6 = x^3+x^2+x+1$

Handwritten notes on lined paper:

Top section:

- 1
- 1
- 0 *
- 1

Bottom section:

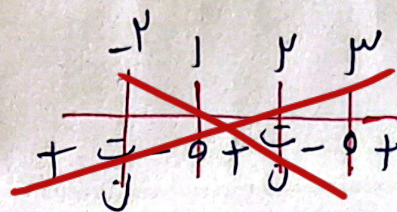
- +
- 1
- 1
- +



>

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

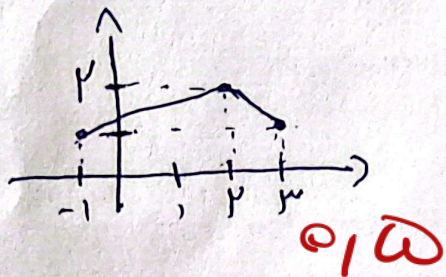
ریشه های تابع $f(x) = 0$, $f(x) = x \rightarrow -2, 1, 2, 3$



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

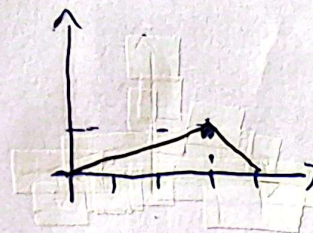
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الف)



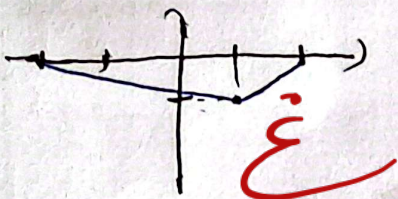
ب)

0, 1, 2, 3



0, 1, 2, 3

ج)



د)

0, 1, 2, 3

