FUNTZIO POLINOMIKOAREN ADIERAZPEN GRAFIKOA

3a) 1a) $y = x^4 - 8x^2 + 7$

1.) DEFINIZIO EREMUA Fu. Polinomikoa Bateragohik $\boxed{Dom\ f = \mathbb{R}}$

2.) EBAKETA PUNTUAK

OY ardatza $x=0 \rightarrow f(0) = 0^4 - 8 \cdot 0^2 + 7 = 7$ $\boxed{P(0,7)}$

OX ardatza $y=0 \rightarrow 0 = x^4 - 8x^2 + 7$

Ek. bikoarotua
$t = x^2 \rightarrow 0 = t^2 - 8t + 7$ $\quad t = \dfrac{8 \pm \sqrt{64 - 4 \cdot 7}}{2}$

$t_1 = 7 < \begin{matrix} x_1 = \sqrt{7} \\ x_2 = -\sqrt{7} \end{matrix}$

$t_2 = 1 < \begin{matrix} x_3 = 1 \\ x_4 = -1 \end{matrix}$

$\boxed{(\sqrt{7}, 0), (-\sqrt{7}, 0), (1,0), (-1,0)}$
$\quad 2,64 \qquad -2,64$

3) SIMETRIA
$\underline{f(-x)} = (-x)^4 - 8(-x)^2 + 7 = x^4 - 8x^2 + 7 = \underline{f(x)}$ $\boxed{\begin{matrix} SIMETRIA \\ BIKOITIA \end{matrix}}$
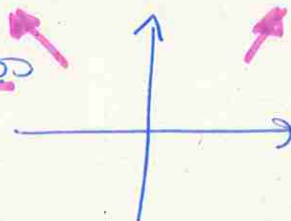
4) Ez do PERIODIKOA

5) ASINTOTAK
Ez dauko asint. bertikolik
$\lim\limits_{x \to +\infty} (x^4 - 8x^2 + 7) = +\infty$
$\lim\limits_{x \to -\infty} (x^4 - 8x^2 + 7) = +\infty$ $\Big\}$ Ador parabolikos

6) HAZKUNDEA

$f'(x) = 4x^3 - 16x$
$f'(x) = 0 \quad 4x^3 - 16x = 0$

$4x(x^2 - 4) = 0$
$\begin{cases} x_1 = 0 \\ x_2 = 2 \\ x_3 = -2 \end{cases}$ Ptu. Sing.

$f'(x)$	$f' < 0$		$f' > 0$		$f' < 0$		$f' > 0$
		-2		0		2	
$f(x)$	$\searrow$	min	$\nearrow$	max	$\searrow$	min	$\nearrow$
		(-2,-9)		(0,7)		(2,-9)	

$GT(-2,0) \cup (2,+\infty)$
$BT(0,-2) \cup (0,2)$
$MOX(0,7)$
$Min(-2,-9), (2,-9)$

7/ AHURTASUNA / GANBILTASUNA.

$$f'(x) = 4x^3 - 16x$$
$$f''(x) = 12x^2 - 16$$

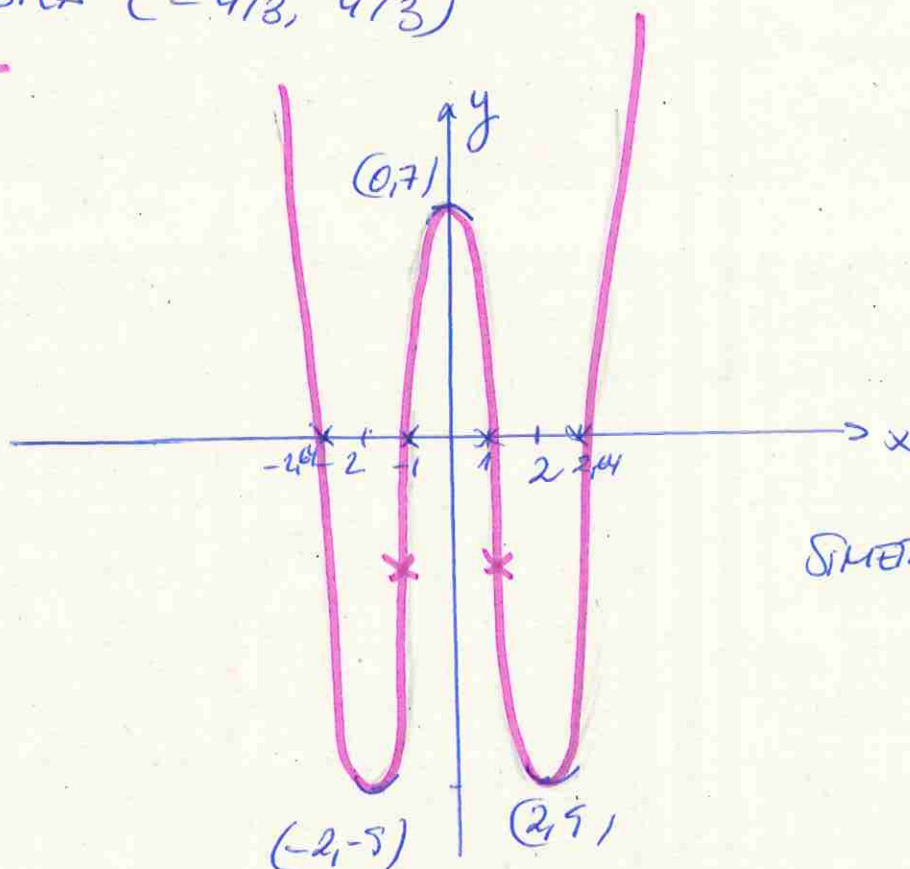$$f''(x) = 0 \quad 12x^2 - 16 = 0 \longrightarrow 4 \cdot (3x^2 - 4) = 0$$

$$\begin{cases} x_1 = -4/3 \text{ INF PUNTAK.} \\ x_2 = \dfrac{4}{3} \end{cases}$$

	$-4/3$		$4/3$	
$f''(x)$	$f'' > 0$		$f'' < 0$	$f'' > 0$
$f(x)$	$\cup$	INF PUNT	$\cap$	INF PUNT $\cup$

INF PUNTUAK $\left(\dfrac{4}{3}, -4,07\right), \left(-\dfrac{4}{3}, -4,06\right)$ ✗

AHURRA $(-\infty, -4/3) \cup (4/3, +\infty)$

GANBILA $(-4/3, 4/3)$

(0,7)

$(-2,-5)$ $(2,5)$

SIMETRIA BIKOITIA