$f(x) = a \cdot \sigma\upsilon\nu 2x + \beta$

$A\left(\frac{3\pi}{4}, -\sqrt{3}\right)$ $B\left(\frac{5\pi}{12}, -2\sqrt{3}\right)$

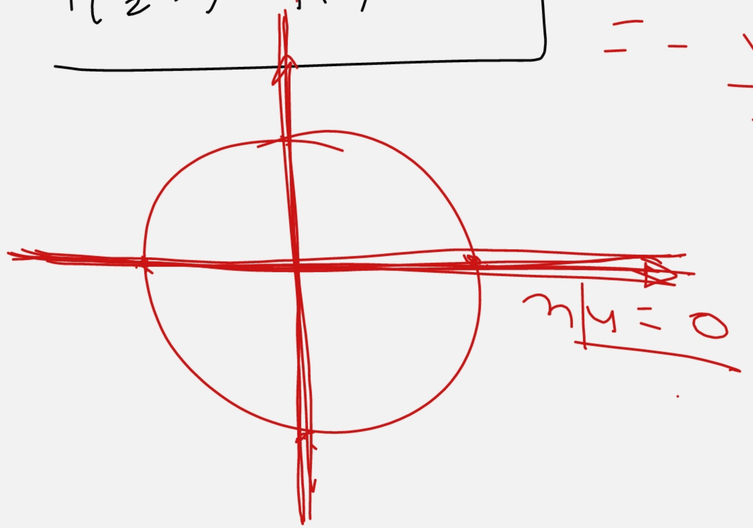
α) $\alpha = ;$ $\beta = ;$

β) max, min

γ) Τομή με άξονες

δ) Εξίσωση

$f\left(\frac{\pi}{2} - x\right) - f(x) = 2$



$\sigma\upsilon\nu\frac{5\pi}{6} = \sigma\upsilon\nu\left(\frac{6\pi}{6} - \frac{\pi}{6}\right)$

$= \sigma\upsilon\nu\left(\pi - \frac{\pi}{6}\right) =$

$= -\sigma\upsilon\nu\frac{\pi}{6}$

$= -\frac{\sqrt{3}}{2}$

α) $A\left(\frac{3\pi}{4}, -\sqrt{3}\right) \in C_f \Leftrightarrow f\left(\frac{3\pi}{4}\right) = -\sqrt{3} \Leftrightarrow$

$a \cdot \sigma\upsilon\nu 2\frac{3\pi}{4} + \beta = -\sqrt{3} \Leftrightarrow \boxed{\beta = -\sqrt{3}}$

$B\left(\frac{5\pi}{12}, -2\sqrt{3}\right) \in C_f \Leftrightarrow f\left(\frac{5\pi}{12}\right) = -2\sqrt{3} \Leftrightarrow$

$a \cdot \sigma\upsilon\nu 2\frac{5\pi}{12} + \beta = -2\sqrt{3} \Leftrightarrow a \cdot \sigma\upsilon\nu\frac{5\pi}{6} - \sqrt{3} = -2\sqrt{3}$

$\Leftrightarrow a \cdot \sigma\upsilon\nu\frac{5\pi}{6} = -\sqrt{3} \Leftrightarrow a\left(-\frac{\sqrt{3}}{2}\right) = -\sqrt{3}$

$\Leftrightarrow 2a\left(-\frac{\sqrt{3}}{2}\right) = -\sqrt{3} \cdot 2 \Leftrightarrow$

$-\sqrt{3} \cdot a = -\sqrt{3} \cdot 2 \Leftrightarrow \boxed{a = 2}$

$f(x) = 2\sigma\upsilon\nu 2x - \sqrt{3}$

(β) $-2 \le 2\sigma\upsilon\nu 2x \le 2 \iff$

$-2-\sqrt{3} \le 2\sigma\upsilon\nu 2x - \sqrt{3} \le 2-\sqrt{3}$

$-2-\sqrt{3} \le f(x) \le 2-\sqrt{3}$

$f(x) = 2-\sqrt{3} \iff \sigma\upsilon\nu 2x = 1 \iff$

$\iff \sigma\upsilon\nu 2x = \sigma\upsilon\nu 0 \iff 2x = 2k\pi \iff x = k\pi$

Άρα $2-\sqrt{3} = f_{max}$ με θέσεις μεγίστου $x = k\pi$, $k \in \mathbb{Z}$

$f(x) = -2-\sqrt{3} \iff \sigma\upsilon\nu 2x = -1 \iff$

$\sigma\upsilon\nu 2x = \sigma\upsilon\nu\pi \iff 2x = 2k\pi \pm \pi \iff$

$2x = 2k\pi + \pi \iff x = k\pi + \frac{\pi}{2}$

$f_{min} = -2-\sqrt{3}$.

θέσεις ελαχίστων $x = k\pi + \frac{\pi}{2}$, $k \in \mathbb{Z}$

γ) Τέμνει τον y'y για $x = 0$

$f(0) = 2\cdot\sigma\upsilon\nu 0 - \sqrt{3} = 2-\sqrt{3}$

$A(0, 2-\sqrt{3})$

Τέμνει τον x'x για $y = 0$

Λύνω την εξίσωση

$f(x) = 0 \iff$

$2\sigma\upsilon\nu 2x - \sqrt{3} = 0 \iff$

$2\sigma\upsilon\nu 2x = \sqrt{3} \iff \sigma\upsilon\nu 2x = \frac{\sqrt{3}}{2} \iff$

$\sigma\upsilon\nu 2x = \sigma\upsilon\nu\frac{\pi}{6} \iff 2x = 2k\pi \pm \frac{\pi}{6}$

$x = k\pi \pm \frac{\pi}{12}$, $k \in \mathbb{Z}$