$t^3 - t - 6 = 0$

$(t-2)(t^2+2t+3) = 0$

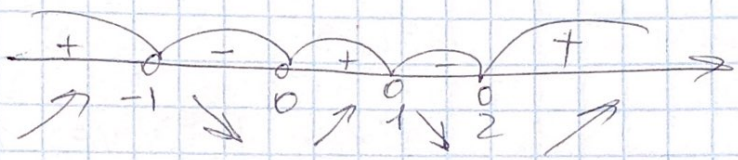
$t = 2$ (точка минимума)

или

$t^2 + 2t + 3 = 0$

$t \in \varnothing$

$f(2) = 2 - 3\ln\frac{1}{3}$ — минимум функции



Функция строго возрастает при:

$x \in (-\infty; -1) \cup (0; 1) \cup (2; +\infty)$

Функция строго убывает при:

$x \in (-1; 0) \cup (1; 2)$

$$y''_x = \frac{\left(\frac{t^3 - t - 6}{4t^3 - 4t}\right)'}{4t} = \frac{(3t^2-1)(4t^3-4t) - (12t^2-4)(t^3-t-6)}{4t(4t^3-4t)^2} =$$

$$= \frac{12t^5 - 12t^3 - 4t^3 + 4t - 12t^5 + 16t^3 + 72t^2 - 4t - 24}{4t(4t^3-4t)^2} =$$

$$= \frac{24(3t^2-1)}{4t(4t^3-4t)^2} = \frac{6(3t^2-1)}{t(4t^3-4t)^2}$$

$$\frac{6(3t^2-1)}{t(4t^3-4t)^2} = 0$$

$3t^2 = 1$

$t = \pm \frac{1}{\sqrt{3}} = \pm \frac{\sqrt{3}}{3}$ – точки перегиба

$\frac{6(3t^2-1)}{t(4t^3-4t)^2} > 0$

$6(3t^2-1) > 0$

$6(3t^2-1) = 0$

$3t^2 - 1 = 0$

$t^2 = \frac{1}{3}$

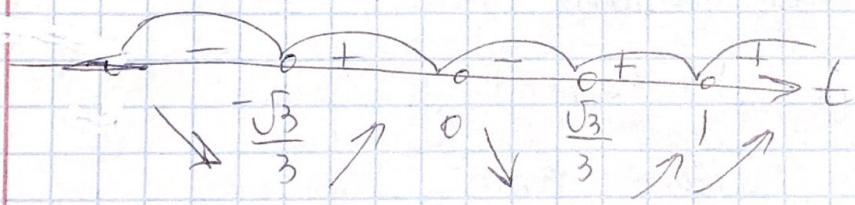
$t = \pm \frac{\sqrt{3}}{3}$

ОДЗ: $t(4t^3-4t)^2 \neq 0$

$t \neq 0$ $\quad 4t^3 - 4t \neq 0$

$t(t^2-1) \neq 0$

$t \neq 0$ $\quad t \neq \pm 1$

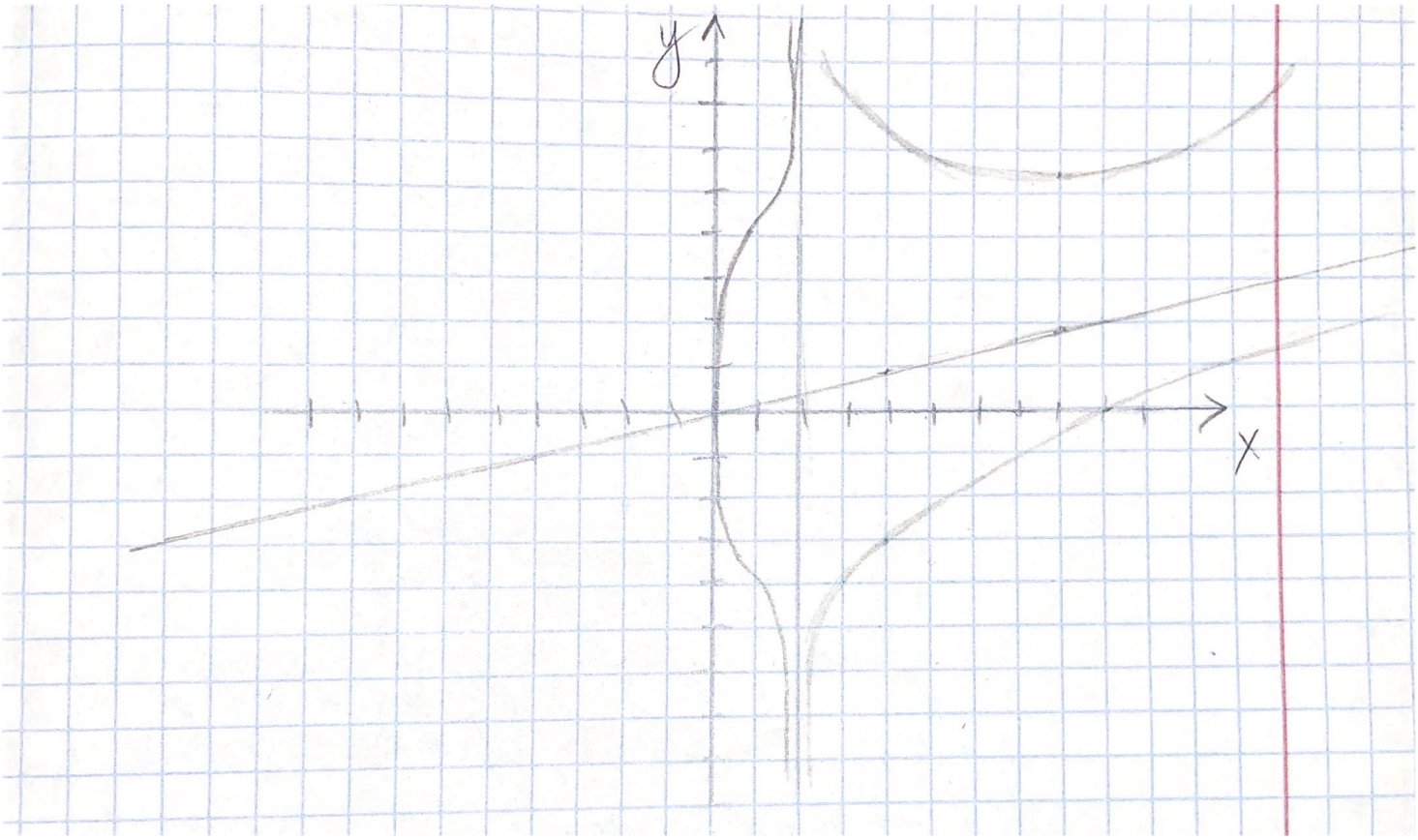


Функция строго выпукла вниз при:

$t \in \left(-\frac{\sqrt{3}}{3}; 0\right) \cup \left(\frac{\sqrt{3}}{3}; 1\right) \cup (1; \infty)$

Функция строго выпукла вверх при:

$t \in \left(-\infty; -\frac{\sqrt{3}}{3}\right) \cup \left(0, \frac{\sqrt{3}}{3}\right)$


y
x