Studiamo la concavità/convessità di f:

$$f''(x) = 3\left[\frac{2}{x^3}\left(\frac{1}{x^2}-\frac{4}{x}+3\right)-\frac{1}{x^2}\left(-\frac{2}{x^3}+\frac{4}{x^2}\right)\right] =$$

$$= \frac{3}{x^3}\left[\frac{2}{x^2}-\frac{8}{x}+6+\frac{2}{x^2}-\frac{4}{x}\right] = \frac{6}{x^3}\left(\frac{2}{x^2}-\frac{6}{x}+3\right)$$

quindi poiché

$$\frac{2}{x^2}-\frac{6}{x}+3 \geq 0 \iff \frac{1}{x} \in \left(-\infty, \frac{3-\sqrt{3}}{2}\right] \cup \left[\frac{3+\sqrt{3}}{2}, +\infty\right)$$

$$\iff x \in (-\infty, 0) \cup \left(0, \frac{2}{3+\sqrt{3}}\right] \cup \left[\frac{2}{3-\sqrt{3}}, +\infty\right)$$

si ha

$$f''(x) \geq 0 \iff x \in \left(0, \frac{2}{3+\sqrt{3}}\right] \cup \left[\frac{2}{3-\sqrt{3}}, +\infty\right)$$

da cui

f convessa $x \in \left(0, \frac{2}{3+\sqrt{3}}\right] \cup \left[\frac{2}{3-\sqrt{3}}, +\infty\right)$

f concava $x \in (-\infty, 0) \cup \left[\frac{2}{3+\sqrt{3}}, \frac{2}{3-\sqrt{3}}\right]$

$x = \frac{2}{3+\sqrt{3}}, \frac{2}{3-\sqrt{3}}$ flessi a tg obliqua