pfisso_main_newton: $g(x) = \frac{x}{2} + \frac{3}{2x}$

$f(x) = x^2 - 3 \qquad f'(x) = 2x$

m.d.Newton: $g(x) = x - \frac{f(x)}{f'(x)} = x - \frac{x^2-3}{2x} = \frac{x^2+3}{2x} = \frac{x}{2} + \frac{3}{2x}$

$\alpha = \pm\sqrt{3}$ Radice di f $\equiv$ Punto fisso di g

CONSIDERIAMO L'APPROSSIMAZIONE DI $\alpha = \sqrt{3}$

dom(g): $\mathbb{R} \setminus \{0\}$; $g(x) > 0$ se $x > 0$; $g'(x) = \frac{1}{2} - \frac{3}{2x^2}$

$g''(x) = \frac{3}{x^3}$

[ASINTOTO VERTICALE : $x = 0$
" OBLIQUO : $y = \frac{1}{2}x$]

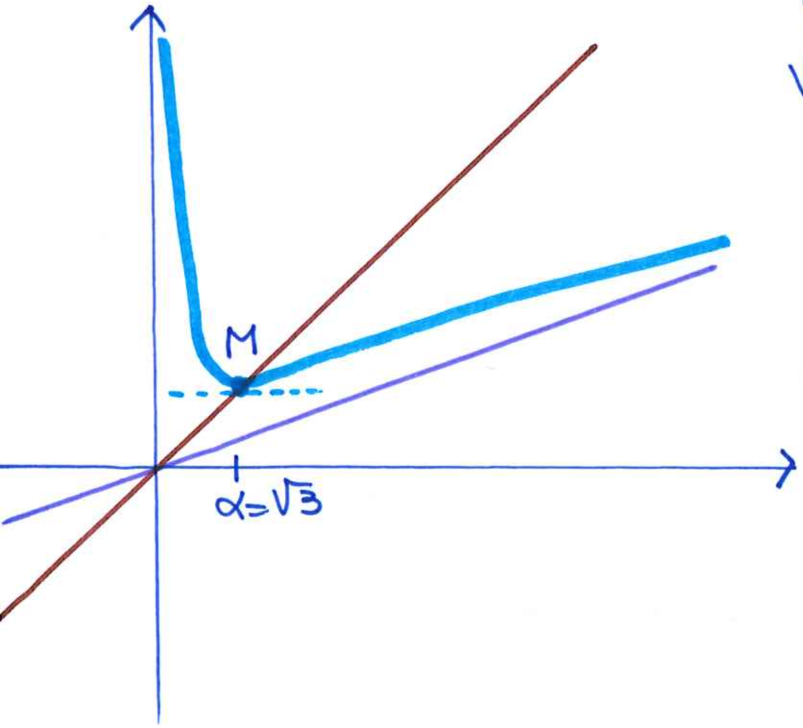
$g'(x) = \frac{1}{2}\left(\frac{x^2-3}{x^2}\right) > 0$

		$-\sqrt{3}$		0		$\sqrt{3}$	
g'	$+$	0	$-$	$\cancel{\exists}$	$-$	0	$+$
	$\nearrow$		$\searrow$		$\searrow$		$\nearrow$

minimo: $M(\sqrt{3}; \sqrt{3})$ [massimo $(-\sqrt{3}; -\sqrt{3})$]

$g'(\sqrt{3}) = 0 \quad g''(\sqrt{3}) \neq 0 \Rightarrow 2°$ ordine (Newton)

$\lim_{n \to +\infty} \frac{e_n}{e_{n-1}^2} = \left|\frac{1}{2} g''(\alpha)\right| \qquad e_n = |x_n - \alpha|$



$0 < x_0 < \alpha = \sqrt{3} \quad x_1 > \sqrt{3}$

$\sqrt{3} < x_0$ successione monotona decrescente limitata inferiormente da $\alpha = \sqrt{3}$

$x_n \searrow \alpha$

$x_0 > 0 \quad x_n \to \alpha$

(per simmetria si ottiene $x_0 < 0$, $x_n \to -\sqrt{3}$)