errori

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Calcolare $f(x) = \frac{1}{1-3x} - \frac{2}{2+3x}$

$$\frac{f}{g} = \frac{f' \cdot g - f \cdot g'}{g^2}$$

derivata

a)

$$cf = \frac{x\,(f'(x))}{f(x)}$$

$$\frac{f_1}{g} = \frac{0\cdot(1-3x) - (1)\cdot(-3)}{(1-3x)^2} = \frac{3}{(1-3x)^2} \qquad \frac{f_2}{g} = \frac{0\cdot(2+3x) - (2)(3)}{(2+3x)^2} = \frac{-6}{(2+3x)^2}$$

$$cf = \frac{x\left(\frac{3}{(1-3x)^2} - \frac{(-6)}{(2+3x)^2}\right)}{\frac{1}{1-3x} - \frac{2}{2+3x}} = \left(\frac{3x}{(1-3x)^2} + \frac{6x}{(2+3x)^2}\right)\cdot\left(\frac{\cancel{1-3x}}{1} - \frac{\cancel{2-3x}}{2}\right) =$$

$$= \frac{3x}{1-3x} + \frac{6x}{4+6x}$$

$\lim_{x\to 0} \frac{3x}{1-3x} + \frac{6x}{4+6x} = 0$ (il limite $\frac{3x}{1-3x} \to \frac{0}{1}$, il limite $\frac{6x}{4+6x} \to \frac{0}{4}$)

il problema è ben condizionato

b)

a1) $f_1 = \frac{1}{1-3x}$ $\quad f_2 = \frac{2}{2+3x}$ $\quad \longmapsto \quad y_1 := f_1 - f_2$