261 Fedele luglio 1991

$$\lim_{x\to 1^-} (1-x^2)^{\frac{\pi}{4}-\operatorname{arctg} x} =$$

$$= \lim_{x\to 1^-} e^{\left(\frac{\pi}{4}-\operatorname{arctg} x\right)\log(1-x^2)} =$$

$$= \lim_{x\to 1^-} e^{\left(\frac{\pi}{4}-\operatorname{arctg} x\right)\frac{1}{1-x^2}\cdot(1-x^2)\log(1-x^2)}$$

$$\lim_{x\to 1^-} (1-x^2)\log(1-x^2) =$$

$$= \lim_{y\to 0} y \log y = 0$$

$$\lim_{x\to 1^-} \frac{\left(\frac{\pi}{4}-\operatorname{arctg} x\right)}{1-x^2}$$

$$y = \frac{\pi}{4} - \operatorname{arctg} x$$

$\operatorname{arctg} x =$

$x = \operatorname{tg}$

$\lim_{y\to 0}$ $1-$

$= \lim_{y\to 0}$

$= \lim_{y\to 0}$

$= \frac{1}{4}$

luglio 1991

2)

=

$-x^2)\log(1-x^2)$

$$\operatorname{arctg} x = \frac{\pi}{4} - y$$

$$x = \operatorname{tg}\left(\frac{\pi}{4} - y\right) = \frac{\operatorname{tg}\frac{\pi}{4} - \operatorname{tg} y}{1 + \operatorname{tg}\frac{\pi}{4}\operatorname{tg} y} = \frac{1 - \operatorname{tg} y}{1 + \operatorname{tg} y}$$

$$\lim_{y \to 0} \frac{y}{1 - \frac{(1-\operatorname{tg} y)^2}{(1+\operatorname{tg} y)^2}} = \lim_{y\to 0} \frac{y\,(1+\operatorname{tg} y)^2}{(1+\operatorname{tg} y)^2 - (1-\operatorname{tg} y)^2} =$$

$$= \lim_{y \to 0} \frac{y\,(1+\operatorname{tg} y)^2}{1 + \operatorname{tg}^2 y + 2\operatorname{tg} y - 1 + \operatorname{tg}^2 y + 2\operatorname{tg} y} =$$

N

O

$$= \lim_{y \to 0} \frac{y\,(1+\operatorname{tg} y)^2}{4\operatorname{tg} y} =$$

$$= \frac{1}{4} \cdot 1 = \frac{1}{4}$$

quindi

$$\lim_{x\to 1^-} e^{\left(\frac{\pi}{4}-\operatorname{arctg}\right)\log(1-x^2)} =$$

$$= e^{\frac{1}{4}\cdot 0} = 1$$

<u>262</u> <u>5 . 1991 - Fedele</u>

$$\lim_{x\to 0} \frac{\operatorname{sen} 3x + x^2}{1-\cos x + 5x} =$$

$$= \lim_{x\to 0} \frac{3x\,\frac{\operatorname{sen} 3x}{3x} + x^2}{x\,\frac{1-\cos x}{x} + 5x} =$$

$$= \lim_{x\to 0} \frac{\cancel{x}\left[3\cdot\frac{\operatorname{sen} 3x}{3x} + x\right]}{\cancel{x}\left[\frac{1-\cos x}{x} + 5\right]} =$$

1- comp. interne
su www.
2- comp. os. lin

$$= \frac{3(1}{(0+}$$