raggr. A-K , dispari

1) $\lim_{x\to-\infty} \dfrac{7x-1}{\sqrt{9x^2+2}-\sqrt{x^2+4}} = \lim_{x\to-\infty} \dfrac{x(7-1/x)}{|x|\left(\sqrt{9+\frac{2}{x^2}}-\sqrt{1+\frac{4}{x^2}}\right)} =$

$= \lim_{x\to-\infty} - \dfrac{(7-1/x)}{\left(\sqrt{9+\frac{2}{x^2}}-\sqrt{1+\frac{4}{x^2}}\right)} = -\dfrac{7}{2}$

$\lim_{x\to0} \dfrac{\operatorname{arctg} 7x^2+\sin 3x^3}{\cos x - e^{4x^2}} = \lim_{x\to0} \left(\dfrac{\operatorname{arctg} 7x^2}{7x^2}\cdot 7x^2 + \dfrac{\sin 3x^3}{3x^3}\cdot 3x^3\right)$

$\cdot \dfrac{1}{x^2\dfrac{\cos x-1}{x^2}+\dfrac{1-e^{4x^2}}{4x^2}\cdot 4x^2} = \lim_{x\to0} \dfrac{x^2\left[\dfrac{\operatorname{arctg} 7x^2}{7x^2}\cdot 7 + \dfrac{\sin 3x^3}{3x^3}\cdot 3x\right]}{-x^2\left(\dfrac{1-\cos x}{x^2}+4\cdot\dfrac{e^{4x^2}-1}{4x^2}\right)}$

$= \dfrac{7}{-1\left(\frac{1}{2}+4\right)} = -\dfrac{14}{9}$

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2) $f(x) = \dfrac{\arcsin 5x^2}{e^{-\sin x}}$ $\qquad -1\le 5x^2\le 1 \iff 5x^2-1\le 0$

(perché $5x^2\ge -1$ è sempre soddisfatta)

$\iff -\dfrac{1}{\sqrt5}\le x\le \dfrac{1}{\sqrt5}$ (le radici dell'eq.ne associate $5x^2-1=0$ sono $x_{1/2}=\pm\dfrac{1}{\sqrt5}$)

$\Rightarrow D_f = \left[-\dfrac{1}{\sqrt5}, \dfrac{1}{\sqrt5}\right]$

$g(x) = \sqrt{5\cdot 2^x - 4\cdot 3^x}$ $\qquad 5\cdot2^x-4\cdot3^x\ge0 \iff 5\cdot2^x\ge4\cdot3^x \iff$

$\dfrac{2^x}{3^x}\ge\dfrac{4}{5} \iff \left(\dfrac{2}{3}\right)^x\ge\dfrac{4}{5} \iff x\ge\log_{2/3}(4/5)$

$\Rightarrow D_g = \left[\log_{\frac{2}{3}}\left(\frac{4}{5}\right), +\infty\right[$