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PLATAFORMA

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① $\lim_{x \to \infty} \frac{3x^2+1}{x^2+5} \Rightarrow \lim_{x \to \infty} \frac{\frac{d}{dx}(3x^2+1)}{\frac{d}{dx}(x^2+5)}$

$\frac{d}{dx}(3x^2+1) = 6x$

$\frac{d}{dx}(x^2+5) = 2x$

$\frac{6x}{2x} = 3 \Rightarrow$

$\lim_{x \to \infty} \frac{3x^2+1}{x^2+5} = \frac{3+\frac{1}{x^3}}{1+\frac{5}{x^2}}$

$\lim_{x \to \infty} \frac{3+0}{1+0} = 3$

② $\lim_{x \to 0} \left(\frac{\operatorname{Sen} x}{x}\right) = \frac{\frac{d}{dx}(\operatorname{sin}(x))}{\frac{d}{dx}(x)} \Rightarrow \frac{\cos(x)}{1} = \frac{1}{1} = 1$

③ $\lim_{x\to\infty} \left(\frac{5x+2}{x^2+1}\right) = \frac{\frac{5}{x}+\frac{2}{x}}{1+\frac{1}{x^2}} = 0$

$\lim_{x\to\infty} \left(\frac{5x+2}{x^2+1}\right) = \frac{\frac{d}{dx}(5x+2)}{\frac{d}{dx}(x^2+1)}$ $\quad \frac{d}{dx}(5x+2) = 5$

$\frac{d}{dx}(x^2+1) = 2x$

$\lim_{x\to\infty} \frac{5x+2}{x^2+1} = 0$

④ $\lim_{x\to 3} \left(\frac{x^2-9}{x^2-3}\right) = \frac{0}{0}$

$\frac{\frac{d}{dx}}{\frac{d}{dx}} \quad \frac{x^2}{x^2} = \frac{a}{a} = 1$

⑤ $\lim_{x\to 0} \left(\frac{e^x-x-1}{x^2}\right) = \frac{\frac{d}{dx}(e^x-x-1)}{\frac{d}{dx}(x^2)}$

$\frac{d}{dx}(e^x-x-1) = e^x-1 \quad (x^2) = 2x$

$\left(\frac{e^x-x-1}{x^2}\right) = \frac{1}{2}$

⑥ $\lim_{x\to\infty} \left(\frac{4x^3-x}{2x^3+5}\right) = \frac{x^3\left(4-\frac{1}{x^2}\right)}{\left(2+\frac{5}{x^3}\right)} = \frac{4-\frac{1}{x^2}}{2+\frac{5}{x^3}}$

$\frac{4-0}{2+0} = \frac{4}{2} = 2 \qquad \frac{4x^3-x}{2x^3+5} = 2$

(7) $\lim_{x \to 2} \left(\frac{x^2-4}{x-2}\right) = \frac{0}{0}$

$\frac{x^2}{x} = \frac{4}{2} = 2$

(8) $\lim_{x \to 0} \left(\frac{1-\cos x}{x^2}\right) = \frac{\frac{d}{dx}(1-\cos(x))}{\frac{d}{dx}(x^2)} = \frac{\frac{d}{dx}(1-\cos x) = \sin(x)}{\frac{d}{dx}(2x)}$

$\frac{\sin(x)}{2x} = \frac{\cos(x)}{2} = \frac{\cos 0}{x^{22}} = \frac{1}{2}$

(9) $\lim_{x \to 1} \left(\frac{x^3-1}{x-1}\right) = \frac{0}{0}$

$x^2+x+1 = 3$

(10) $\lim_{x \to \infty} \left(\frac{x^2+x}{x^2}\right) = \frac{x^2\left(1+\frac{1}{x}\right)}{x^2} = \left(1+\frac{1}{x}\right)$

$1+0 = 1$