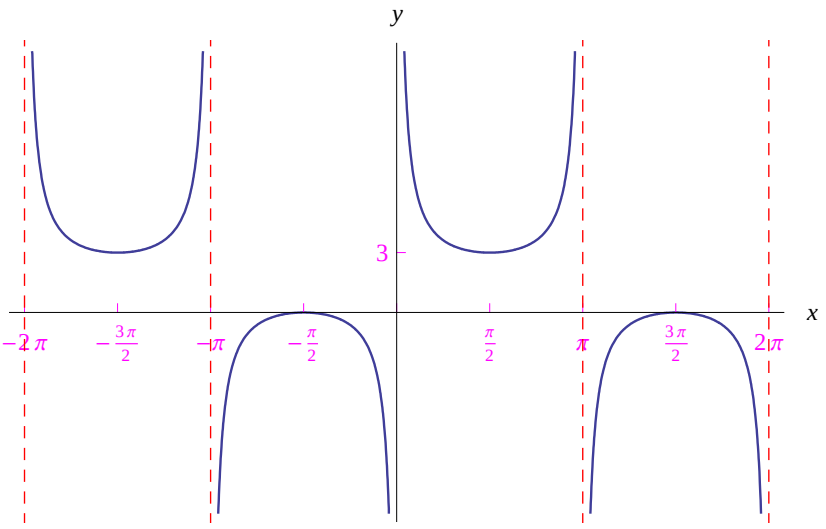
MATEMATICA OPEN SOURCE – HTTP://WWW.EXTRABYTE.INFO
Quaderni di Analisi Matematica – 2016

Matematica Open Source

$$\frac{d}{dx}f(x) \quad \sum_{k=0}^{+\infty} a_k \quad \int f(x)\,dx \quad \oint_{\Gamma} (X\,dx + Y\,dy + Z\,dz)$$

Esempio di limite di funzione trigonometrica

Marcello Colozzo



Esercizio 1 *Calcolare:*

$$\lambda = \lim_{x \to \frac{\pi}{2}} \frac{3\cos^2 x}{2\sin x\,(1-\sin x)}$$

Soluzione

Abbiamo la forma indeterminata $0/0$. Eseguiamo il cambio di variabile $t = \frac{\pi}{2} - x$, per cui $\cos x = \sin t$, $\sin x = \cos t$:

$$\begin{aligned}
\lambda &= \lim_{t \to 0} \frac{3\sin^2 t}{2\cos t\,(1-\cos t)} \\
&= \frac{3}{2} \lim_{t \to 0} \frac{\frac{\sin^2 t}{t^2}}{\cos t \left(\frac{1-\cos t}{t^2}\right)} \\
&= \frac{3}{2} \frac{\lim_{t \to 0} \left(\frac{\sin t}{t}\right)^2}{\lim_{t \to 0} \cos t \cdot \lim_{t \to 0} \left(\frac{1-\cos t}{t^2}\right)} \\
&= \frac{3}{2} \frac{1}{1 \cdot \frac{1}{2}} = 3
\end{aligned}$$