

2. Evaluate the following limits:

$$\text{a. } \lim_{x \rightarrow 0} \frac{1 - x^2/2 - \cos x}{x^4} = \lim_{x \rightarrow 0} \frac{-x + \sinh x}{4x^3} = \lim_{x \rightarrow 0} \frac{-1 + \cosh x}{12x^2} = \lim_{x \rightarrow 0} \frac{-\sinh x}{24x} = -\frac{1}{24}$$

L'H L'H

↑ ↓ ↓

L'H 1

$$\text{b. } \lim_{x \rightarrow 0} \frac{x - \tan x}{x^3} = \lim_{x \rightarrow 0} \frac{x \cos x - \sinh x}{x^3 \cos x} = \lim_{x \rightarrow 0} \frac{\cos x - x \sinh x - \cos x}{3x^2 \cos x - x^3 \sinh x}$$

L'H

↓

$$= \lim_{x \rightarrow 0} \frac{-\frac{\sinh x}{x}}{3 \cos x - x \sinh x} = -\frac{1}{3}$$

→ 1

↓ ↓

1 0