Matemática para Engenharia I - Mat 0311 - Lista de Exercícios. prof: Iesus Carvalho Diniz

lacktriangle Limite Trigonométrico Fundamental

Exercício 1 Calcule os limites abaixo.

a)
$$\lim_{x\to 0} \frac{\sin(3x)}{x}$$
 b) $\lim_{x\to 0} \frac{\sin(5x)}{\sin(x)}$ c) $\lim_{x\to 0} \frac{\sin^2\left(\frac{x}{2}\right)}{x^2}$ d) $\lim_{x\to 0} \frac{\tan(2x)}{x}$ e) $\lim_{x\to 0} \frac{1-\cos(2x)}{x\sin(x)}$

$$f) \lim_{x \to 0} \frac{\sin(3x)}{\sqrt{x+2} - \sqrt{2}} \quad g) \lim_{x \to 0} \frac{1 - \cos(2x)}{x \sin(x)} \quad h) \lim_{x \to 0} \frac{3}{x \csc(x)} \quad i) \lim_{x \to 0} \frac{\sqrt{1 - \cos(x)}}{\tan(2x)}$$

$$j) \lim_{x \to 0} \frac{\sqrt{1 - \cos(x)}}{\tan(2x)} \quad k) \lim_{x \to 0} \frac{\sin(x) + 1 - \cos(x)}{x} \quad l) \lim_{x \to \frac{\pi}{4}} \frac{\sin(4x)}{1 - \sqrt{2}\cos(x)}$$

$$\text{j) } \lim_{x \to 0} \frac{\sqrt{1 - \cos(x)}}{\tan(2x)} \quad \text{k) } \lim_{x \to 0} \frac{\sin(x) + 1 - \cos(x)}{x} \quad \text{l) } \lim_{x \to \frac{\pi}{4}} \frac{\sin(4x)}{1 - \sqrt{2}\cos(x)}$$

Notação: $\cot = \cot \operatorname{angente}, \ \tan = \operatorname{tangente}, \ \csc = \operatorname{cossecante} \ \operatorname{e} \ \sin = \operatorname{seno}$