

Algunos límites importantes:

$$\lim_{x \rightarrow 0} \frac{\text{sen}(x)}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos(x)}{x} = 0$$

$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e \quad (\text{Jacob Bernoulli})$$

$$\lim_{x \rightarrow 0} (1 + x)^{1/x} = e$$

$$\lim_{n \rightarrow \infty} \frac{n}{\sqrt[n]{n!}} = e$$

$$\lim_{n \rightarrow \infty} \left(\sum_{k=0}^n \frac{1}{k!}\right) = 1 + \frac{1}{1!} + \frac{1}{2!} + \frac{1}{3!} + \frac{1}{4!} + \dots = e$$

Hallar explícitamente 10 de los siguientes límites:

1. $\lim_{x \rightarrow 1} \frac{x^3 + 2x^2 - x - 2}{x^2 - 1}$

2. $\lim_{x \rightarrow 0} \frac{\text{sen}(5x)}{x}$

3. $\lim_{x \rightarrow 0} \frac{e^{6x} - 1}{x}$

4. $\lim_{n \rightarrow \infty} \left(1 + \frac{7}{n}\right)^n$

5. $\lim_{h \rightarrow 0} \frac{\frac{1}{x+h} - \frac{1}{x}}{h}$

6. $\lim_{h \rightarrow 0} \frac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h}$

7. $\lim_{h \rightarrow 0} \frac{\frac{1}{(x+h)^n} - \frac{1}{x^n}}{h}$

$$8. \quad \lim_{h \rightarrow 0} \frac{\sqrt{x+h} - \sqrt{x}}{h}$$

$$9. \quad \lim_{h \rightarrow 0} \frac{\frac{1}{\sqrt{x+h}} - \frac{1}{\sqrt{x}}}{h}$$

$$10. \quad \lim_{h \rightarrow 0} \frac{\cos(x+h) - \cos(x)}{h}$$

$$11. \quad \lim_{h \rightarrow 0} \frac{\cos(3(x+h)) - \cos(3x)}{h}$$

$$12. \quad \lim_{h \rightarrow 0} \frac{e^{2(x+h)} - e^{2x}}{h}$$

$$13. \quad \lim_{h \rightarrow 0} \frac{\sqrt[3]{x+h} - \sqrt[3]{x}}{h}$$