L'Hopital's rule

Suppose $f_1(x)$ and $f_2(x)$ are such that

$$\lim f_1(x) = \lim f_2(x) = 0$$

or

$$\lim f_1(x) = \lim f_2(x) = \pm\infty .$$

Then

$$\boxed{\lim \frac{f_1(x)}{f_2(x)} = \lim \frac{f_1'(x)}{f_2'(x)}}$$

Ex 1

$$f_1(x) = \log x$$
$$f_2(x) = x$$

$$\lim_{x\to\infty} \frac{\log x}{x} = \lim_{x\to\infty} \frac{\frac{1}{x}}{1} = \frac{1}{\infty} = 0.$$