

# Le Hopitals' Rule for LIMITS.

*This resource was written by Derek Smith with the support of CASIO New Zealand. It may be freely distributed but remains the intellectual property of the author and CASIO.*

Select RUN mode from the main menu by using the arrow keys to highlight the RUN icon or pressing 1.



$$\lim_{x \rightarrow -2} \frac{(x+2)^3}{(x+2)} = \lim_{x \rightarrow -2} (x+2)^2 = (-2+2)^2 = 0$$

But . . . what if they were not so simple!

**Le Hopitals' Rule:** If  $\lim_{x \rightarrow a} \frac{f(x)}{g(x)} = \frac{0}{0}$  then  $\lim_{x \rightarrow a} \frac{f'(x)}{g'(x)} = \lim_{x \rightarrow a} \frac{f(x)}{g(x)}$

**Example:**  $\lim_{x \rightarrow 0} \frac{\sin x}{x} = \lim_{x \rightarrow 0} \frac{\cos x}{1} = \frac{\cos 0}{1} = 1$

And

$$\lim_{x \rightarrow -2} \frac{(x+2)^3}{(x+2)} = \lim_{x \rightarrow -2} \frac{3(x+2)^2}{1} = \frac{3(-2+2)^2}{1} = 0$$

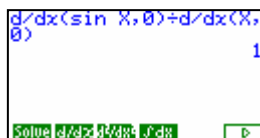
Using the calculator to calculate these types of problems.

Enter in the following in **RUN** mode:

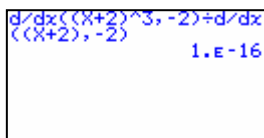
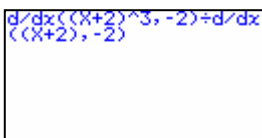


d/dx is found in the key presses **OPTN** then **CALC**

**EXE** for the solution.



and



interpret this answer 1.E-16 as 0