

**Example:**  $\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x}$

This is similar to an example we saw earlier in the course. Here  $f(x) = \sin 5x$ ,  $g(x) = \sin 2x$ , and  $a = 0$ . Since  $f(a) = g(a) = \sin 0 = 0$ , we can apply l'Hôpital's rule and find this limit:

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x} &= \lim_{x \rightarrow 0} \frac{5 \cos 5x}{2 \cos 2x} && \text{(l'Hop)} \\ &= \lim_{x \rightarrow 0} \frac{5 \cos(5 \cdot 0)}{2 \cos(2 \cdot 0)} \\ &= \frac{5}{2}. \end{aligned}$$

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