

**Calculate the following:**  $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$ :

$$\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$$

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

$$= \lim_{x \rightarrow 2} \frac{(x + 2)\cancel{(x - 2)}}{\cancel{(x - 2)}}$$

$$= \lim_{x \rightarrow 2} x + 2$$

$$= 4$$

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**Calculate the following:**  $\lim_{x \rightarrow 0} \frac{\sin x}{x}$ :

Applying L'Hopital's rule:

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = \lim_{x \rightarrow 0} \frac{(\sin x)'}{x'}$$

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

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**Calculate the following:**  $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$ :

Applying L'Hopital's rule:

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

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

$$= 1$$