

SECTION 4.8 L'HÔPITAL'S RULE

1. L'Hôpital's Rule says:

2. Example $0/0$.

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

$$(b) \lim_{x \rightarrow 0} \frac{\sin(4x)}{3e^{3x} - 3}$$

3. Example ∞/∞ .

$$(a) \lim_{x \rightarrow \infty} \frac{\ln(x)}{\sqrt{x}}$$

$$(b) \lim_{x \rightarrow \infty} \frac{2e^x + 1}{1 - 3e^x}$$

4. Example $0 \cdot \infty$.

(a) $\lim_{x \rightarrow \infty} x \sin\left(\frac{\pi}{x}\right)$

(b) $\lim_{x \rightarrow 0^+} x \ln(x)$

5. Example 1^∞ or 0^0 or ∞^0

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

(b) $\lim_{x \rightarrow 0^+} x^{\sin(x)}$