

L'hôpital's Rule (Notes)

$$\lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4} = \frac{0}{0}$$

Indet. form

$$\lim_{x \rightarrow 4} \frac{2x}{1} = 8$$

take derivative
of top; bottom,
then try again.

L'Hôpital's Rule

added to booklets

If $\lim_{x \rightarrow c} \frac{f(x)}{g(x)}$ gives an indeterminate form
[$\frac{0}{0}$, 1^∞ , $0 \cdot \infty$, 0^0 ,
 $\infty - \infty$]

$$\text{then } \lim_{x \rightarrow c} \frac{f(x)}{g(x)} = \lim_{x \rightarrow c} \frac{f'(x)}{g'(x)}$$

ex/ $\lim_{x \rightarrow 3} \frac{2x^2 - 4}{x} = \frac{2 \cdot 3^2 - 4}{3} = \frac{14}{3}$

no indeterminate form..
so don't use l'hopitals rule

ex/ $\lim_{x \rightarrow \infty} \frac{4x^2 - 3x}{8 - 6x^2} = \frac{\infty}{-\infty}$ //

l'hop $\lim_{x \rightarrow \infty} \frac{8x - 3}{-12x} = \frac{\infty}{\infty}$

l'hop $\lim_{x \rightarrow \infty} \frac{8}{-12} \rightarrow \frac{-2}{3}$

$$\lim_{x \rightarrow 6} \frac{\sqrt{x+10} - 4}{x-6} = \frac{0}{0} \quad \text{"\u221e"}$$

$$\lim_{x \rightarrow 6} \frac{\frac{1}{2}(x+10)^{-1/2} \cdot 1 - 0}{1}$$

$$\lim_{x \rightarrow 6} \frac{1}{2} \cdot \frac{1}{\sqrt{x+10}} \rightarrow \frac{1}{2} \cdot \frac{1}{\sqrt{16}} = \frac{1}{2} \cdot \frac{1}{4} = \frac{1}{8}$$

Due Mon: Selected problems
from "Mixed Review"

Due 11/28: p. 564:
#5-17, 23-30.