

AP Calculus L'Hopitals Homework B

Name: _____

Use L'Hopital's Rule to evaluate the limit.

1. $\lim_{x \rightarrow 0} \left(\frac{\sin(5x)}{x} \right)$

2. $\lim_{x \rightarrow 0^+} (\ln(x) - \ln(\sin(x)))$

3. $\lim_{x \rightarrow \infty} x \tan\left(\frac{1}{x}\right)$

4. $\lim_{x \rightarrow 0^+} \left(1 + \frac{1}{x}\right)^x$

5. $\lim_{x \rightarrow 0^+} (e^{-x} + x)^{\frac{1}{x}}$

6. $\lim_{x \rightarrow \infty} (\ln x)^{\frac{1}{x}}$

7. $\lim_{x \rightarrow 1^+} (x^2 - 2x + 1)^{x-1}$

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

9. The function f is continuous over the interval $[-3, 10]$ and satisfies the following:

x	-3	$-3 < x < 0$	0	$0 < x < 3$	3	$3 < x < 7$	7	$7 < x < 10$	10
f	0	-	-4	-	0	+	6	+	0
f'	0	-	DNE	+	0	+	DNE	-	0
f''	-	-	DNE	-	0	+	DNE	+	+

- a) Find the absolute extrema of f and where they occur.
- b) Find the x -values of any points of inflection. Justify your response.
- c) Provide a possible sketch of the graph using the grid below

