

Name: _____

L'Hopital's Rule

1) Evaluate the limits

1) $\lim_{x \rightarrow 4} \frac{x^4 - 256}{x^2 - 16}$

2) $\lim_{x \rightarrow 0} \frac{e^x - 1}{\tan 2x}$

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

4) $\lim_{x \rightarrow 0} \frac{e^x - x - 1}{x^2}$

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

6) $\lim_{x \rightarrow 0^+} x^2 \ln x$

7) $\lim_{x \rightarrow 1} \frac{x^{3/2} - 1 + (x - 1)^{3/2}}{(x^2 - 1)^{3/2} - x + 1}$

8) $\lim_{x \rightarrow \frac{1}{2}} \ln(2x - 1)^{x - \frac{1}{2}}$

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

10) $\lim_{x \rightarrow 0} \frac{1 - \cos x}{2 \sin^2 x}$

11) $\lim_{x \rightarrow \frac{\pi}{4}} (1 - \tan x) \sec 2x$

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

13) $\lim_{x \rightarrow -1} \frac{\ln(2 + x)}{x + 1}$

14) $\lim_{x \rightarrow 0} \frac{e^{2x} - e^{-2x}}{\sin x}$

15) $\lim_{x \rightarrow 0} \frac{8^x - 2^x}{4x}$

16) $\lim_{x \rightarrow 0} \frac{\ln \sec 2x}{\ln \sec x}$

17) $\lim_{x \rightarrow 0^+} \frac{\ln \cot x}{e^{\csc^2 x}}$

18) $\lim_{x \rightarrow \frac{\pi}{2}^-} e^{-\tan x} \sec^2 x$

19) $\lim_{x \rightarrow 1} \left(\frac{1}{\ln x} - \frac{x}{x - 1} \right)$

20) $\lim_{x \rightarrow \frac{\pi}{2}} (\sin x - \cos x)^{\tan x}$