

Calculus Practice: Limits Using L'Hospital's Rule 1b**Evaluate each limit using L'Hôpital's Rule.**

1) $\lim_{x \rightarrow 0} \frac{\sin(3x)}{\sin(5x)}$

2) $\lim_{x \rightarrow 0} \frac{\tan(3x)}{x}$

3) $\lim_{x \rightarrow 0^+} \frac{\ln \sin x}{\ln \tan x}$

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

5) $\lim_{x \rightarrow 1} \frac{2 \ln x}{x - 1}$

6) $\lim_{x \rightarrow -1} \frac{3 \ln x^2}{x^2 - 1}$

7) $\lim_{x \rightarrow -3} \frac{x^2 - x - 12}{x + 3}$

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

9) $\lim_{x \rightarrow \infty} \frac{\ln x}{2x}$

10) $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{3x^3}$

$$11) \lim_{x \rightarrow 0} \frac{e^{3x} - 1}{\sin(3x)}$$

$$12) \lim_{x \rightarrow 25} \frac{\sqrt{x} - 5}{x - 25}$$

$$13) \lim_{x \rightarrow \infty} \frac{x}{\ln x}$$

$$14) \lim_{x \rightarrow 0} \frac{e^x - 1}{2x}$$

$$15) \lim_{x \rightarrow 0^+} \frac{5 \ln \tan x}{\ln \sin x}$$

$$16) \lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$$

$$17) \lim_{x \rightarrow \infty} \frac{e^{2x}}{2x^2}$$

$$18) \lim_{x \rightarrow \infty} \frac{2x^2}{e^x}$$

$$19) \lim_{x \rightarrow \infty} \frac{\ln x^4}{\ln(x+1)^2}$$

$$20) \lim_{x \rightarrow 0} \frac{2x^2}{e^x - 1 - x}$$

Calculus Practice: Limits Using L'Hospital's Rule 1b

Evaluate each limit using L'Hôpital's Rule.

1) $\lim_{x \rightarrow 0} \frac{\sin(3x)}{\sin(5x)}$

$$\frac{3}{5}$$

2) $\lim_{x \rightarrow 0} \frac{\tan(3x)}{x}$

$$3$$

3) $\lim_{x \rightarrow 0^+} \frac{\ln \sin x}{\ln \tan x}$

$$1$$

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

$$2$$

5) $\lim_{x \rightarrow 1} \frac{2 \ln x}{x - 1}$

$$2$$

6) $\lim_{x \rightarrow -1} \frac{3 \ln x^2}{x^2 - 1}$

$$3$$

7) $\lim_{x \rightarrow -3} \frac{x^2 - x - 12}{x + 3}$

$$7$$

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

$$6$$

9) $\lim_{x \rightarrow \infty} \frac{\ln x}{2x}$

$$0$$

10) $\lim_{x \rightarrow 0} \frac{e^{2x} - 1}{3x^3}$

$$\infty$$

$$11) \lim_{x \rightarrow 0} \frac{e^{3x} - 1}{\sin(3x)}$$

1

$$12) \lim_{x \rightarrow 25} \frac{\sqrt{x} - 5}{x - 25}$$

$\frac{1}{10}$

$$13) \lim_{x \rightarrow \infty} \frac{x}{\ln x}$$

∞

$$14) \lim_{x \rightarrow 0} \frac{e^x - 1}{2x}$$

$\frac{1}{2}$

$$15) \lim_{x \rightarrow 0^+} \frac{5 \ln \tan x}{\ln \sin x}$$

5

$$16) \lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$$

$\frac{1}{4}$

$$17) \lim_{x \rightarrow \infty} \frac{e^{2x}}{2x^2}$$

∞

$$18) \lim_{x \rightarrow \infty} \frac{2x^2}{e^x}$$

0

$$19) \lim_{x \rightarrow \infty} \frac{\ln x^4}{\ln(x+1)^2}$$

2

$$20) \lim_{x \rightarrow 0} \frac{2x^2}{e^x - 1 - x}$$

4