

**CALCULUS I-Worksheet #9**

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1.  $\lim_{x \rightarrow \infty} \sin x$

2.  $\lim_{x \rightarrow \infty} \frac{\cos x}{x}$

3.  $\lim_{x \rightarrow \infty} \frac{\sin x}{8x^2}$

4.  $\lim_{x \rightarrow 1^-} \frac{3}{x-1}$ 

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5.  $\lim_{h \rightarrow 0} \frac{\ln(x+h) - \ln x}{h}$

6.  $\lim_{h \rightarrow 0} \frac{(2+2h)-2}{h}$

7.  $\lim_{h \rightarrow 0} \frac{\sin\left|\frac{\pi}{2} + h\right| - 1}{h}$

8.  $\lim_{x \rightarrow 0} \frac{x^2 + 3x}{\sin x}$ 

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9.  $\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x}$

10.  $\lim_{x \rightarrow 0} \frac{1 - \cos 3x}{\sin 3x}$

11.  $\lim_{u \rightarrow 0} \frac{u}{\sin u}$

12.  $\lim_{x \rightarrow \infty} \frac{20x^2 - 13x + 5}{5 - 4x^3}$ 

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13.  $\lim_{x \rightarrow 0} \frac{x^3 - 3x^2}{x}$

14.  $\lim_{x \rightarrow 2} \frac{x^3 - 27}{x - 3}$

15.  $\lim_{x \rightarrow -4} \frac{x^3 + 64}{x^2 - 16}$ 

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16.  $y = x^{\cos x}$  Find  $\frac{dy}{dx}$

17.  $x^2 y + 2 = x$  Find  $\frac{dy}{dx}$ 

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18. Find the slope of the tangent line to the curve  $y = e^x$  at  $(1, e)$ .19. Write the equation of the line tangent to  $y=4x^2+3$  at  $(2,19)$ .

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