

In Exercises 67–78, determine the limit of the trigonometric function (if it exists).

$$67. \lim_{x \rightarrow 0} \frac{\sin x}{5x}$$

$$69. \lim_{x \rightarrow 0} \frac{\sin x(1 - \cos x)}{2x^2}$$

$$71. \lim_{x \rightarrow 0} \frac{\sin^2 x}{x}$$

$$73. \lim_{h \rightarrow 0} \frac{(1 - \cos h)^2}{h}$$

$$75. \lim_{x \rightarrow \pi/2} \frac{\cos x}{\cot x}$$

$$77. \lim_{t \rightarrow 0} \frac{\sin 3t}{2t}$$

$$78. \lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 3x} \quad \left[\text{Hint: Find } \lim_{x \rightarrow 0} \left(\frac{2 \sin 2x}{2x} \right) \left(\frac{3x}{3 \sin 3x} \right) \right]$$

$$68. \lim_{x \rightarrow 0} \frac{3(1 - \cos x)}{x}$$

$$70. \lim_{\theta \rightarrow 0} \frac{\cos \theta \tan \theta}{\theta}$$

$$72. \lim_{x \rightarrow 0} \frac{\tan^2 x}{x}$$

$$74. \lim_{\phi \rightarrow \pi} \phi \sec \phi$$

$$76. \lim_{x \rightarrow \pi/4} \frac{1 - \tan x}{\sin x - \cos x}$$

Graphical, Numerical, and Analytic Analysis In Exercises 79–82, use a graphing utility to graph the function and estimate the limit. Use a table to reinforce your conclusion. Then find the limit by analytic methods.

$$79. \lim_{t \rightarrow 0} \frac{\sin 3t}{t}$$

$$80. \lim_{h \rightarrow 0} (1 + \cos 2h)$$

$$81. \lim_{x \rightarrow 0} \frac{\sin x^2}{x}$$

$$82. \lim_{x \rightarrow 0} \frac{\sin x}{\sqrt[3]{x}}$$