# Limits of Trigonometric Functions

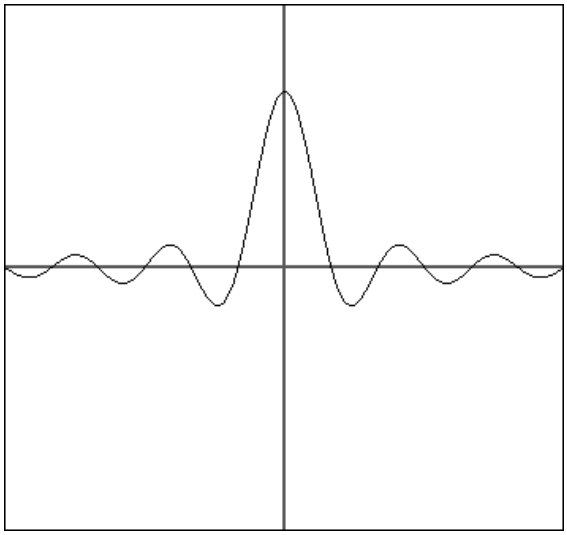
Step 1: Substitute the value into the limit.
Step 2: If the denominator equals zero, try one of the following techniques:

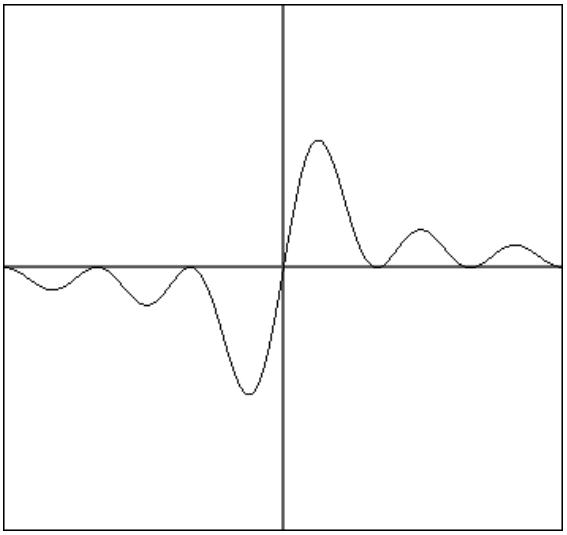
a) Apply a trigonometric identity.
b) Apply a special limit.

<u>Special Limits</u>

$$\lim_{x\to 0}\frac{\sin x}{x}=1$$

$$\lim_{x\to 0}\frac{1-\cos x}{x}=0$$





Directions: Evaluate each limit.

1) $\lim_{\theta\to 0}\sin\theta =$

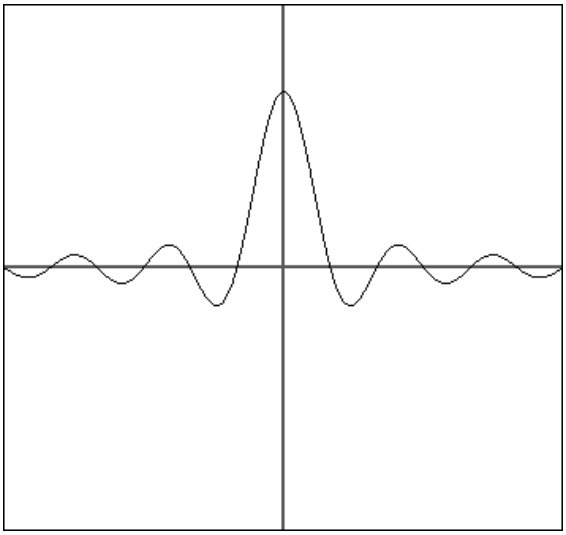
2) $\lim_{\theta\to 0}\cos\theta =$

3) $\lim_{\theta\to 0}\tan\theta =$

4) $\lim_{\theta\to 0}\frac{\sin\theta}{\theta} =$

$$\lim_{x\to 0}\frac{\sin x}{x}=1$$

5) $\lim_{x \to \infty} \frac{\sin x}{x} =$



6) $\lim_{x \to 0} \frac{\sin 3x}{x} =$

7) $\lim_{x \to 0} \frac{\tan x}{x} =$

8) $\lim_{x \to 0} \frac{\sin^2 x}{x^2} =$

9) $\lim_{x \to 0} \frac{\tan x}{x^2 + 1} =$

10) $\lim_{x \to \pi} x \bullet \sec x =$

11) $\lim_{x \to 0} \frac{3(1 - \cos x)}{x} =$

12) $\lim_{x \to \frac{\pi}{4}} \frac{1 - \tan x}{\sin x - \cos x} =$