

A Trigonometric Limit

Rhino Participation Bonus (+1) to your Participation Score due Thursday Jan. 25

- a. Use a graph or table to conjecture the value of $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$.

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

- b. Complete the boxes to indicate what instantaneous rate of change $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$ represents.

$$f(x) = \boxed{} \quad \text{The value } a = \boxed{}$$

$$f'(\boxed{}) = \boxed{} \text{ represents } \underline{\hspace{15em}}$$

Sketch the graph of $y = f(x)$ and the tangent line with slope equal to $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$.

- c. Multiply numerator and denominator by $(\cos x + 1)$ to find $\lim_{x \rightarrow 0} \frac{\cos x - 1}{x}$ algebraically.

Use correct limit notation for full credit.

