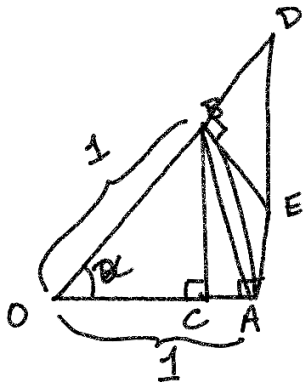


We will prove that $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$.



$$|BC| = |OB| \sin x = \sin x$$

$$x = \text{arc } \widehat{AB}$$

$$\text{So, } |BC| < |AB| < \text{arc } \widehat{AB}$$

$$\Rightarrow \sin x < x$$

$$\Rightarrow \frac{\sin x}{x} < 1.$$

Now,

$$\text{arc } \widehat{AB} \leq |AE| + |EB|$$

$$= |AE| + |ED|$$

$$= |AD|$$

$$= |OA| \tan x = \tan x$$

$$\Rightarrow x \leq \frac{\sin x}{\cos x}$$

$$\Rightarrow \cos x \leq \frac{\sin x}{x}.$$

$$\text{Thus, } \cos x \leq \frac{\sin x}{x} < 1.$$

Squeeze thm \therefore