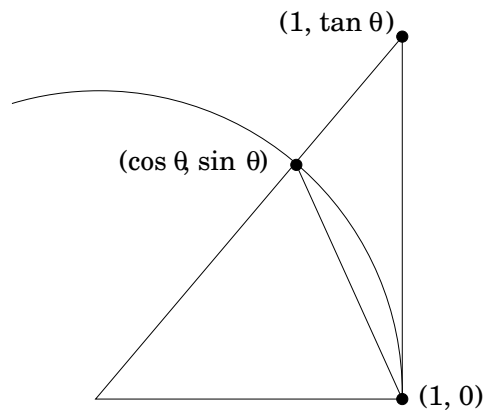


Math 181 Honors Quiz 8 Version A

1. Show that $\lim_{\theta \rightarrow 0^+} \frac{\sin \theta}{\theta} = 1$ using geometry and the ϵ - δ definition of limit.



Math 181 Honors Quiz 8 Version A

2. Let $f(x) = \sin x$. Use the limits

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1 \quad \text{and} \quad \lim_{x \rightarrow 0} \frac{\cos x - 1}{x} = 0,$$

the limit laws and the limit definition of derivative to show that $f'(x) = \cos x$.

3. [Extra Credit] Use the limit definition of derivative to show that

$$w(x) = \sqrt{x} \quad \text{implies} \quad w'(x) = \frac{1}{2\sqrt{x}}.$$