1. Let $C$ be the right half of the unit circle centered at the origin. Does there exist an entire function $f : C \to \mathbb{C}$ with the specified values on $C$:

$$f(e^{i\theta}) = e^{i\theta/2} \quad \text{for all} \quad \theta \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right].$$

Justify your answer.