Quiz   **Name**

1. Consider the polar function $r = f(\theta) = 2e^{\theta}$. Show that it its graph is an equiangular spiral by computing the angle α for this function. Use the approximations $2e^{-2\pi} \approx 0.0035$, $2e^{-\pi} \approx 0.1$, $2e^{-\frac{\pi}{2}} \approx 0.4$, $2e^{\frac{\pi}{4}} \approx 4.2$, and $2e^{\frac{\pi}{2}} \approx 9.6$ to sketch a careful graph of $r = f(\theta) = 2e^{\theta}$ over $-2\pi \le \theta \le \frac{\pi}{2}$ on the polar coordinate system provided.

2. Determine the length of the graph that you sketched above.

Formulas: $f'(\theta) = f(\theta) \cdot \tan(\alpha - \frac{\pi}{2})$ $\qquad$ $L = \int_a^b \sqrt{f(\theta)^2 + f'(\theta)^2} \, d\theta$ $\qquad$ $A = \int_a^b \frac{1}{2} f(\theta)^2 \, d\theta$