

MTH 317/617
Quiz #1

1. Write the complex number

$$\frac{e^{\pi+2i} + e^{\pi-2i}}{2}$$

in the form $a + bi$ where $a, b \in \mathbb{R}$.

$$\begin{aligned} \frac{e^{\pi+2i} + e^{\pi-2i}}{2} &= \frac{e^{\pi} e^{2i} + e^{\pi} e^{-2i}}{2} \\ &= \frac{e^{\pi} (e^{2i} + e^{-2i})}{2} \\ &= \frac{e^{\pi} (\cos(2) + i \sin(2) + \cos(-2) + i \sin(-2))}{2} \\ &= e^{\pi} \cos(2) \end{aligned}$$