姓名: SOLUTION　　葉均承　　應數一線性代數

學號: _____　　**Quiz 11**　　考試日期: 2024/05/14

1. 請框出答案. 2. 不可使用手機、計算器，禁止作弊!

1. Express z/w in the form $a+bi$, where $a, b \in \mathbb{R}$, if

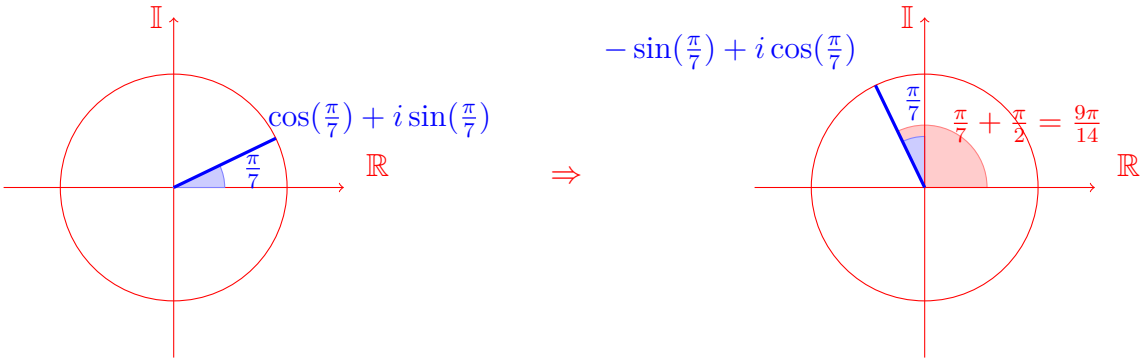
$$z = 1+5i,\ w = 4-2i$$

Answer: $z/w = \dfrac{-3+11i}{10}$

2. Find the modulus and principal argument of $3(-\sin(\frac{\pi}{7}) + i\cos(\frac{\pi}{7}))$.

Answer: **modulus: 3, principal argument:** $\frac{\pi}{7} + \frac{\pi}{2} = \frac{9\pi}{14}$.

Solution：



3. Given z and w be complex numbers. Prove that $\overline{z}\ \overline{w} = \overline{zw}$.

Solution：

Section 9.1, Theorem 9.1 (3)

4. Given z and w be nonzero complex numbers. Please find all possible z and w such that zw a pure imaginary number (純虛數).

Solution：

計算過程在此省略，只給最終答案。

Let $z = a + bi$ and $w = c + di$.

(a) $a = d = 0$, $b, c \in \mathbb{R}$.

(b) $b = c = 0$, $a, d \in \mathbb{R}$.

(c) $a = b, c = d$.

(d) $a = d, b = c$.