

Math 295 - Fall 2020

Warm up 1.1

Due before class on Friday September 4

Please turn in this assignment on Gradescope.

Problem 1 : (Objectives A1, A5) Let $z = 1 + 2i$ and $w = 2 - i$. Compute the following:

a) $z + 3w$

b) $\bar{w} - z$

c) $\operatorname{Re}(w^2 + w)$

Problem 2 : (Objectives A1, A2) Write in rectangular form.

a) $\sqrt{2}e^{i\frac{3\pi}{4}}$

b) $34e^{i\frac{\pi}{2}}$

c) $-e^{i250\pi}$

Problem 3 : (Objectives A1, A2) Write in polar form.

a) $1 + i$

b) $-i$

c) $\left(\frac{1-i}{\sqrt{3}}\right)^4$

Problem 4 : (Objective A3) Use the definition $e^{i\phi} = \cos \phi + i \sin \phi$ to show that $e^{i3\phi} = (e^{i\phi})^3$.

(Hint: You can show this using the addition formulae for sin and cos: For every $u, v \in \mathbb{R}$, we have that $\cos(u + v) = \cos u \cos v - \sin u \sin v$ and $\sin(u + v) = \sin u \cos v + \cos u \sin v$.)

Problem 5 : (Objectives A3, A4) Find three complex numbers z such that $z^3 = 1$.