

Problem sheet 11

- (1) Write all of the following in the form $a + bi$, and determine a and b
- (a) $z + \zeta$, where $z = 3 + 2i$ and $\zeta = 5 + 2i$.
 - (b) $z\zeta$ with z and ζ as in (a).
 - (c) z/ζ .
 - (d) ζ/z .
 - (e) $\sqrt{2}/(1 + i)$.
 - (f) $(1 + i)^2$.
 - (g) $(1 + i)^7$.
 - (h) $(1 + i)^{-3}$.
 - (i) $(1 + \sqrt{3}i)^4(\sqrt{3} + i)^6$.
- (2) Find all solutions to $z^6 + a^6 = 0$ if $a > 0$.
- (3) Prove that if $|z| = 1$ then $1/z = \bar{z}$.