Complex numbers

chapter 3

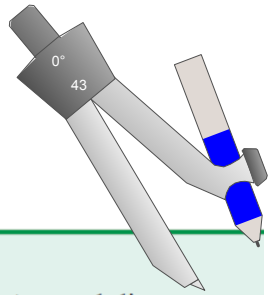
Section 3.4 Argand diagram – Modulus

PROJECT MATHS Text & Tests 6

Argand diagram

If $z = a + bi$, then the modulus of z, written as $|z|$, is given by

$$|z| = \sqrt{a^2 + b^2}.$$

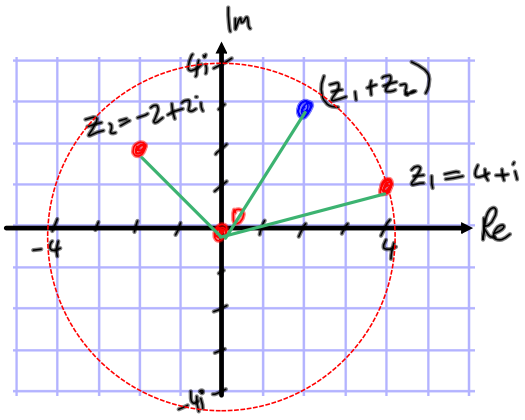


Example 1

Given that $z_1 = 4 + i$ and $z_2 = -2 + 2i$, plot the following on an Argand diagram:

$0, z_1, z_2$ and $(z_1 + z_2)$.

Also calculate $|z_1|, |z_2|$ and $|z_1 + z_2|$.



$z_1 = 4+i$

$z_2 = -2+2i$

$z_1 + z_2 = 2+3i$

$|z_1| = \sqrt{4^2+1^2} = \sqrt{17}$

$|z_2| = \sqrt{(-2)^2+2^2} = \sqrt{8}$

$|z_1+z_2| = \sqrt{2^2+3^2} = \sqrt{13}$

Exercise 3.4

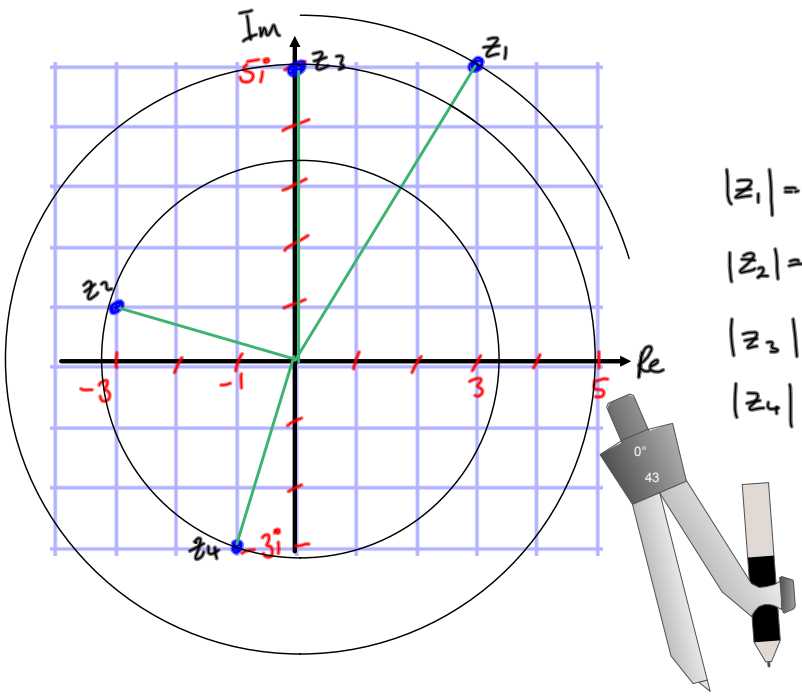
1. Plot each of the following complex numbers on an Argand diagram:

(i) $z_1 = 3 + 5i$ (ii) $z_2 = -3 + i$ (iii) $z_3 = 5i$ (iv) $z_4 = -1 - 3i$

find modulus of z_1, z_2, z_3 and z_4.

$z = a + bi$

$|z| = \sqrt{a^2 + b^2}$



$|z_1| = \sqrt{3^2 + 5^2} = \sqrt{34}$

$|z_2| = \sqrt{3^2 + 1^2} = \sqrt{10}$

$|z_3| = 5$

$|z_4| = \sqrt{1^2 + 3^2} = \sqrt{10}$