Complex numbers

chapter 3

Section 3.4 Argand diagram – Modulus

PROJECT MATHS Text & Tests 6

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

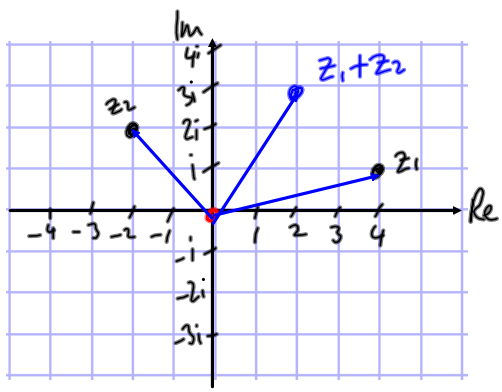
$$|z| = \sqrt{a^2 + b^2}.$$

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 $|z_1 + z_2|$.



$z_1 + z_2 = 2 + 3i$

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

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

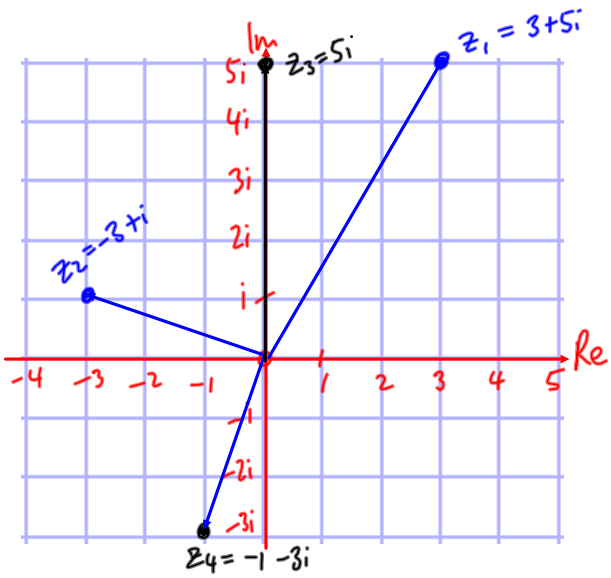
$|z_1 + z_2| = \sqrt{2^2 + 3^2} = \sqrt{13}$

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) $z_4 = -1 - 3i$

$|z_1|$, $|z_2|$, $|z_3|$, $|z_4|$?



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

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

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

$$|z_3| \quad |5i| = \sqrt{0^2+5^2} = 5$$

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