

MATH ASSIGNMENT – COMPLEX NUMBERS

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1 Theoretical background

1.1 General expression

DEFINITION 1. The **complex number** z is a number that can be expressed in the form

$$z = a + bi, \quad (1)$$

where $a, b \in \mathbb{R}$ and i is an **imaginary unit**, defined as:

$$i = \sqrt{-1} \quad \text{or} \quad i^2 = -1.$$

1.2 Complex plane

A complex number can be presented as a point in a two-dimensional **complex plane** – see Fig. 1.

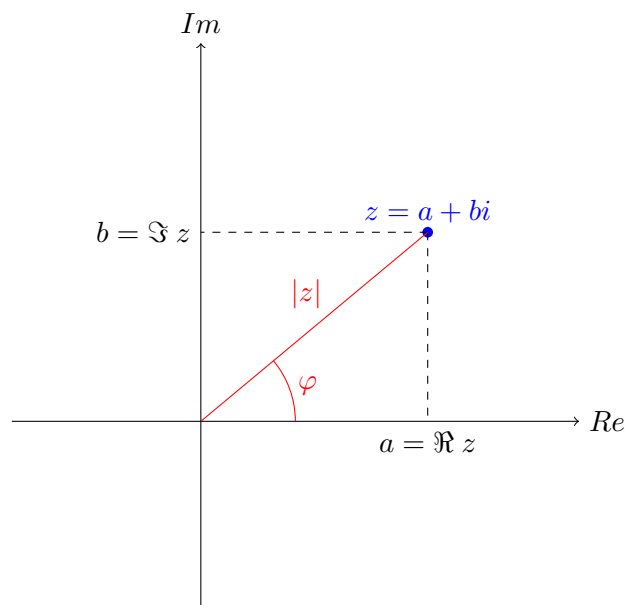


Figure 1: Complex plane.

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2 Homework

Task 1 Calculate the following:

(a) $\frac{1+5i}{2-i}$

(c) i^{14}

(b) $(2 - 3i) \cdot (4 + 3i)$

(d) $\frac{1-i}{1+i}$

Task 2 This is a two part assignment:

1. If ... then ... is?

(a) 1

(b) 0

(c) -1

2. If ... then ...?

(a) Yes

(b) No

Task 3 As you can see on Fig. 1... Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat.