Classwork on Complex Numbers

1. Consider the complex number $\left[\rho, \frac{2\pi}{3}\right]$.

   (a) Find its standard (algebraic) form.

   (b) Find the square of this number using its standard form.

   (c) Find the polar form of the number you found in item 1b.

   (d) Find the square of the number obtained in item 1c using the polar form.

2. Consider the complex number $\frac{1+i}{1-i}$.

   (a) Find the polar forms of both the numerator and the denominator.

   (b) Find the quotient using the polar forms found at item 2a.

   (c) Find the quotient using the standard form given in the text.

   (d) Represent in the Gauss plane the number obtained in item 2c

3. Find all the numbers in the formula $\sqrt[8]{i^4}$, writing the outcomes in standard form.

4. Represent in the Gauss plane the tenth roots of $1 = 1 + 0i$.

5. Consider the complex numbers $1 + i\sqrt{3}$ and $\sqrt{3} + i$.

   (a) Represent these numbers in the complex plane.

   (b) Represent in the complex plane the product of the two numbers, without making calculations.

Maximum score for each exercise:

- exercises 1 and 2: 0.5 for each question;

- exercises 3 and 4: 2 points each;

- exercise 5: 1 point for each question.

Time for the classwork: 50 minutes.