Complex Project

Mohamed Amine BEN AMOR
and
Khaoula DEROUICHE

March 12, 2021

This project is devoted to do some basic operations in the real line and the complex plane.

1. Algebra operations.

2. Absolute values.

3. Cosinus and Sinus.

4. The Cartesian plane.

5. The Complex plane.

6. Real part and Imaginary part of Complex Numbers.

7. Modulus

8. Argument

Resources

- https://www.youtube.com/watch?v=SP-YJe7Vldo&ab_channel=KhanAcademy

- https://www.youtube.com/watch?v=g5_ojBMubAg&ab_channel=ExamSolutions

- https://math.mit.edu/~stoopn/18.031/complexnumbers.pdf from page 1 to page 4.

- https://www.khanacademy.org/math/precalculus/x9e81a4f98389efdf:complex/x9e81a4f98389efdf:complex-abs-angle/v/basic-complex-analysis

- https://www.khanacademy.org/math/precalculus/x9e81a4f98389efdf:complex/x9e81a4f98389efdf:complex-div/v/complex-conjugates

Project

- First project: Quiz

  1. The real part of $3 + 4i$ is :
     a) 3.
     b) 4.
     c) none of them.
  2. The conjugate number of $3 + 4i$ is:
     a) 5.

b) $3 - 4i$.

c) none of them.

3. The absolute value of $3 + 4i$ is:

   a) 5.

   b) $3 - 4i$.

   c) none of them.

4. The real part of a complex z is:

   a) $\frac{z + \bar{z}}{2}$.

   b) $\frac{z - \bar{z}}{2i}$.

   c) none of them.

5. If θ is the argument of a complex z and r its absolute value then the real part of z is:

   a) $r \cos(\theta)$.

   b) $r \sin(\theta)$.

   c) $\tan(\theta)$.

- Second project: Complex numbers

   1. Build the struct "complex" where a complex number $a + ib$ is represented by two doubles.

   2. Write a function that returns the conjugate of a given complex number.

   3. Write a function that returns the modulus of a given complex number.

   4. Write a function that returns the argument of a given complex number.

   5. Write a function that perform the additional operation to complex numbers.

   6. Write a function that perform the subtraction operation to complex numbers.

   7. Write a function that perform the multiplication operation to complex numbers.

   8. Write a function that perform the division operation to complex numbers.

   9. Write a function that returns the real and the imaginary parts of a complex number given its modulus and arguments.

   10. Write a function that display the complex numbers.