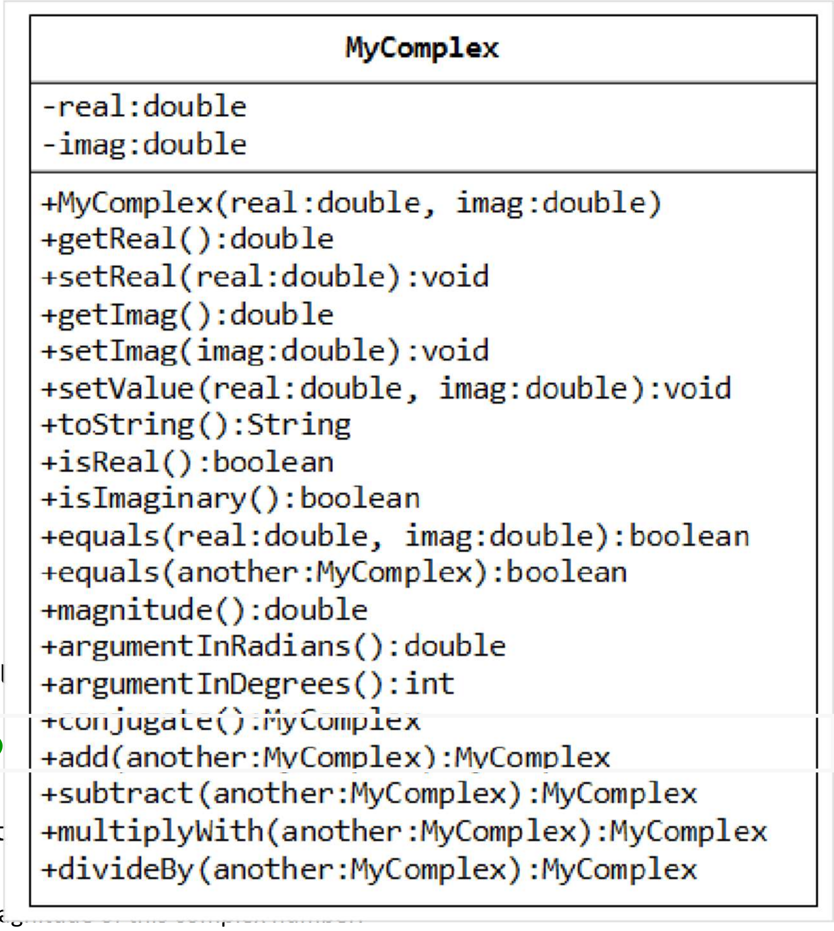
1.1 Exercise: The MyComplex class

A class called MyComplex, which models complex numbers x+yi, is designed as shown in the class diagram. It contains:



```
MyComplex
-real:double
-imag:double
+MyComplex(real:double, imag:double)
+getReal():double
+setReal(real:double):void
+getImag():double
+setImag(imag:double):void
+setValue(real:double, imag:double):void
+toString():String
+isReal():boolean
+isImaginary():boolean
+equals(real:double, imag:double):boolean
+equals(another:MyComplex):boolean
+magnitude():double
+argumentInRadians():double
+argumentInDegrees():int
+conjugate():MyComplex
+add(another:MyComplex):MyComplex
+subtract(another:MyComplex):MyComplex
+multiplyWith(another:MyComplex):MyComplex
+divideBy(another:MyComplex):MyComplex
```

- Two instance variable named real(double) and imag(double) which stores the real and imaginary parts of the complex number respectively.
- A constructor that creates a MyComplex instance with the given real and imaginary values.
- Getters and setters for instance variables real and imag.
- A method setValue() to set the value of the complex number.
- A toString() that returns "(x + yi)" where x and y are the real and imaginary parts respectively.
- Methods isReal() and isImaginary() that returns true if this complex number is real or imaginary, respectively. Hint:

  A method equals(double real, doubl

-
  ```
  return (imag == 0);   // isReal()
  ```

  complex number of (real, imag).
- An overloaded equals(MyComplex anot

  MyComplex instance another.
- A method magnitude() that returns the ma

  ```
  magnitude(x+yi) = Math.sqrt(x2 + y2)
  ```

- Methods argumentInRadians() and argumentInDegrees() that returns the argument of this complex number in radians (in double) and degrees (in int) respectively.

  ```
  arg(x+yi) = Math.atan2(y, x) (in radians)
  ```

  Note: The Math library has two arc-tangent methods, Math.atan(double) and Math.atan2(double, double). We commonly use the Math.atan2(y, x) instead of Math.atan(y/x) to avoid division by zero. Read the documentation of Math class in package java.lang.
- A method conjugate() that returns a new MyComplex instance containing the complex conjugate of this instance.

  ```
  conjugate(x+yi) = x - yi
  ```