Quiz 3

Due Date: 21:30, March 31, 2016

1 Problem

In this quiz, you need to implement a class call **ComplexNumber**. The member functions of **ComplexNumber** should be implemented exactly as definition in `complex.h`. Remember that you do not need to modify `complex.h` and `p1.cpp`.

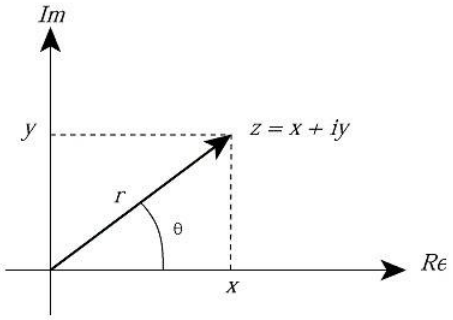

Figure 1: Polar coordinate. (from http://ptolemy.eecs.berkeley.edu/eecs20/sidebars/complex/polar.html)

complex.h

```
#ifndef COMPLEX_NUMBER_H_INCLUDED
#define COMPLEX_NUMBER_H_INCLUDED//start to define the class
class ComplexNumber {
public:
    ComplexNumber();//default constructor
    ComplexNumber(double, double); //constructor
    double getReal() const;
    double getImag() const;
    void setReal(double);
    void setImag(double);
    double Magnitude() const;//return the radius of polar coordinate.
    //return the phase of polar coordinate in degree.
    double Phase() const;
    ComplexNumber operator!(); //return the conjugate number
    ComplexNumber operator+(const ComplexNumber&);
    ComplexNumber operator-(const ComplexNumber&);
    ComplexNumber operator*(const ComplexNumber&);
    ComplexNumber operator/(const ComplexNumber&);
    void show(); //show the complex number in the form "(real,imag)"
    void polar_coordinate(); // show the polar coordinate.

private:
    double real;
    double imag;
};
#endif // end of definition of class
```

p1.cpp

```
#include <iostream>
#include "complex.h"

int main(){
        ComplexNumber p(1,1),q(1,-1),r;
        p.polar_coordinate();
        r.show();
        r=p+q;
        r.show();
        r=!p;
        r.show();
        r=p-q;
        r.show();
        r=p*q;
        r.show();
        r=p/q;
        r.show();

        return 0;
}
```

1.1 Sample output

```
1.41421 and 45 degree
(0,0)
(2,0)
(1,-1)
(0,2)
(2,0)
(0,1)
```

2 How to compile the code at workstation?

You can use this command to compile the code:

```
$ g++ -std=c++14 p1.cpp complex.h complex.cpp -o main -Wall -Wextra -pedantic -g3
```

3 How to submit the assignment?

Just upload **complex.cpp** to the **e-Campus (E3)** website and do not rename the file or put in into any directory. You will get no credit if you don't follow the rule. Note: You just can upload the file to e3 **ONCE**!!