

1.

```
//p153 1
#include <iostream>
using namespace std;

class Complex{
public:
    Complex(){
        real = 0;
        imag = 0;
    }
    Complex(double r,double i){
        real = r;
        imag = i;
    }
    void display();
    double real;
    double imag;
};

void Complex::display(){
    cout<<real<<"+"<<imag<<"i";
}

Complex operator + (Complex &c1,Complex &c2){
    return Complex(c1.real+c2.real,c1.imag+c2.imag);
}

int main(){
    Complex c1(3,4),c2(5,6);
    Complex c3 = c1 + c2;
    c3.display();
    return 0;
}
```

The screenshot shows a C++ IDE with a file named `p153_1.cpp`. The code defines a `Complex` class with a default constructor, a constructor taking `double` parameters, a `display` method, and an `operator +` for adding two complex numbers. The `main` function creates two `Complex` objects, `c1` and `c2`, adds them to get `c3`, and displays the result.

```
1 //p153 1
2 #include <iostream>
3 using namespace std;
4
5 class Complex{
6 public:
7     Complex(){
8         real = 0;
9         imag = 0;
10    }
11    Complex(double r,double i){
12        real = r;
13        imag = i;
14    }
15    void display();
16    double real;
17    double imag;
18 };
19
20 void Complex::display(){
21     cout<<real<<"+"<<imag<<"i";
22 }
23
24 Complex operator + (Complex &c1,Complex &c2){
25     return Complex(c1.real+c2.real,c1.imag+c2.imag);
26 }
27
28 int main(){
29     Complex c1(3,4),c2(5,6);
30     Complex c3 = c1 + c2;
31     c3.display();
32     return 0;
33 }
```

The execution window shows the output `8+10i` and a message: "Process exited after 0.04753 seconds with return value 0 请按任意键继续..."

2.

```
// p153 2
#include <iostream>
using namespace std;

class Complex{
public:
    Complex(){
        real = 0;
        imag = 0;
    }
    Complex(double r,double i){
        real = r;
        imag = i;
    }
    void display(){
        cout<<real<<"+"<<imag<<"i"<<endl;
    }
    Complex operator + (Complex &c2){
        return Complex(real+c2.real,imag+c2.imag);
    }
}
```

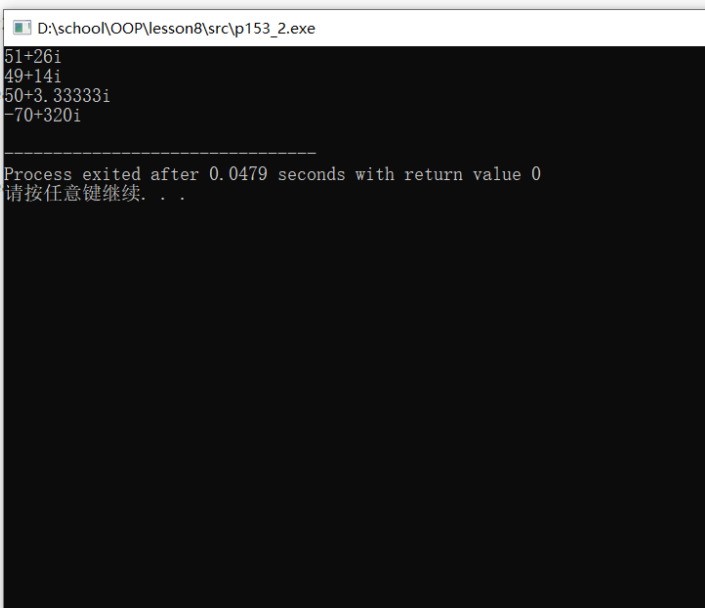
```

Complex operator - (Complex &c2){
    return Complex(real-c2.real,imag-c2.imag);
}
Complex operator * (Complex &c2){
    double a = real,b = imag,c = c2.real,d = c2.imag;
    return Complex(a*c-b*d,a*d+b*c);
}
Complex operator / (Complex &c2){
    double a = real,b = imag,c = c2.real,d = c2.imag;
    return Complex(a/c,b/d);
}
double real;
double imag;
};

int main(){
    Complex c1(50,20),c2(1,6);
    Complex c3 = c1 + c2;
    Complex c4 = c1 - c2;
    Complex c5 = c1 / c2;
    Complex c6 = c1 * c2;
    c3.display();
    c4.display();
    c5.display();
    c6.display();
    return 0;
}

```

```
16      cout<<real<<"+"<<imag<<"i"<<endl;
17  }
18  Complex operator + (Complex &c2){
19      return Complex(real+c2.real,imag+c2.imag);
20  }
21  Complex operator - (Complex &c2){
22      return Complex(real-c2.real,imag-c2.imag);
23  }
24  Complex operator * (Complex &c2){
25      double a = real,b = imag,c = c2.real,d = c2.imag;
26      return Complex(a*c-b*d,a*d+b*c);
27  }
28  Complex operator / (Complex &c2){
29      double a = real,b = imag,c = c2.real,d = c2.imag;
30      return Complex(a/c,b/d);
31  }
32  double real;
33  double imag;
34  };
35
36  int main(){
37      Complex c1(50,20),c2(1,6);
38      Complex c3 = c1 + c2;
39      Complex c4 = c1 - c2;
40      Complex c5 = c1 / c2;
41      Complex c6 = c1 * c2;
42      c3.display();
43      c4.display();
44      c5.display();
45      c6.display();
46      return 0;
47  }
```



3.

```
// p153 3
#include <iostream>
using namespace std;

class Complex{
public:
    Complex(){
        real = 0;
        imag = 0;
    }
    Complex(double r,double i){
        real = r;
        imag = i;
    }
    void display(){
        cout<<real<<" + "<<imag<<"i"<<endl;
    }
    Complex operator + (Complex &c2){
        return Complex(real+c2.real,imag+c2.imag);
    }
    Complex operator + (int &c2){
```

```

        return Complex(real + c2,imag);
    }
    double real;
    double imag;
};

Complex operator + (int c1,Complex &c2){
    return Complex(c2.real + c1,c2.imag);
}

int main(){
    Complex c1(2,5),c2(3,7);
    int i = 9;
    Complex sum1 = c1 + c2;
    Complex sum2 = i + c1;
    Complex sum3 = c1 + i;
    cout<<"c1 + c2 = ";
    sum1.display();
    cout<<"i + c1 = ";
    sum2.display();
    cout<<"c1 + i = ";
    sum3.display();

    return 0;
}

```

```

1 // p153 3
2 #include <iostream>
3 using namespace std;
4
5 class Complex{
6     public:
7     Complex(){
8         real = 0;
9         imag = 0;
10    }
11    Complex(double r,double i){
12        real = r;
13        imag = i;
14    }
15    void display(){
16        cout<<real<<" + "<<imag<<"i"<<endl;
17    }
18    Complex operator + (Complex &c2){
19        return Complex(real+c2.real,imag+c2.imag);
20    }
21    Complex operator + (int &c2){
22        return Complex(real + c2,imag);
23    }
24    double real;
25    double imag;
26 };
27
28 Complex operator + (int c1,Complex &c2){
29     return Complex(c2.real + c1,c2.imag);
30 }
31

```

D:\school\OOP\lesson8\src\p153_3.exe

```

c1 + c2 = 5 + 12i
i + c1 = 11 + 5i
c1 + i = 11 + 5i

```

Process exited after 0.05368 seconds with return value 0
请按任意键继续. . .