REVIEW: REFERENCES, BIG FOUR OPERATOR OVERLOADING

Problem Solving with Computers-II

```
#include <iostream>
using namespace std;

int main(){
    cout<<"Hola Facebook\n";
    return 0;
}
```

Read the syllabus. Know what’s required. Know how to get help.

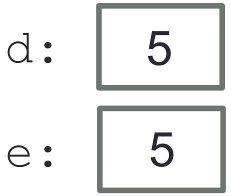
CLICKERS OUT

References in C++

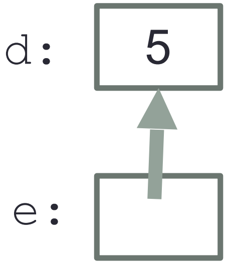
```
int main() {
   int d = 5;
   int &e = d;
}
```

Which diagram below represents the result of the above code?

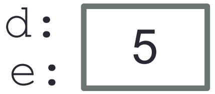
A.



B.



C.



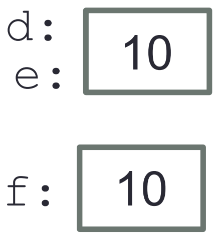
D. This code causes an error

References in C++

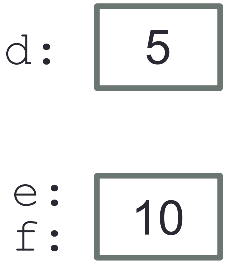
```
int main() {
   int d = 5;
   int &e = d;
   int f = 10;
   e = f;

}
```

How does the diagram change with this code?

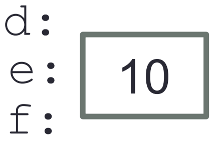
A.



B.



C.



D. Other or error

Passing parameters as references

```
int main() {
   int d = 5;
   foo(d);
   cout<<d;
}
```

```
void foo(int& e) {
   e = 10;
}
```

What is the output of this code?

A. 5

B. 10

C. Error

D. None of the above

Copy constructor (Review)

- In which of the following cases is the copy constructor called?

```
A.  Player p1; Player p2(“Jill”);
B.  Player p1(“Jill”); Player p2(p1);
C. Player *p1 = new Player(“Jill”); Player p2 = *p1;
D. B&C
E. A, B & C
```

Copy constructor (Review)

- The copy constructor creates and initializes a new object to be the copy of another object of the class
- C++ provides a default copy constructor if one is not defined in the definition of the class
- The copy constructor is called in all the following cases, assuming p1 is an existing object of Player:

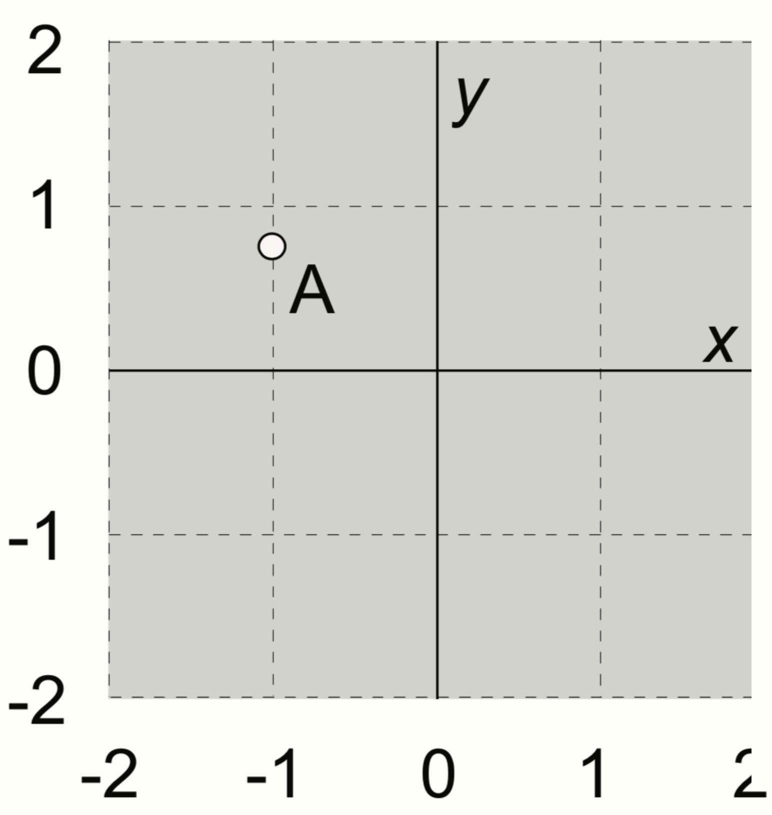
```
Player p2(p1);
Player p2 = p1;
Player *p2 = new Player(p1);
```

Copy assignment

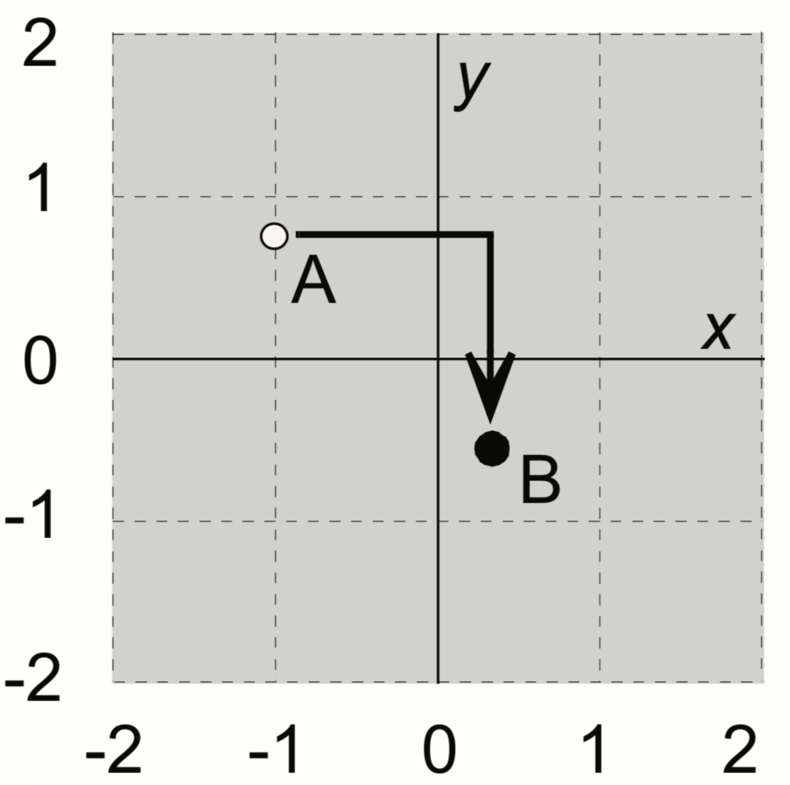
- Default behavior: Copies the member variables of one object into another

```
Player p1(“Jill”); // Parametrized constructor
Player p2;
p2 = p1; // Copy assignment function is called
```

The point class (Chapter 2, section 2.4)

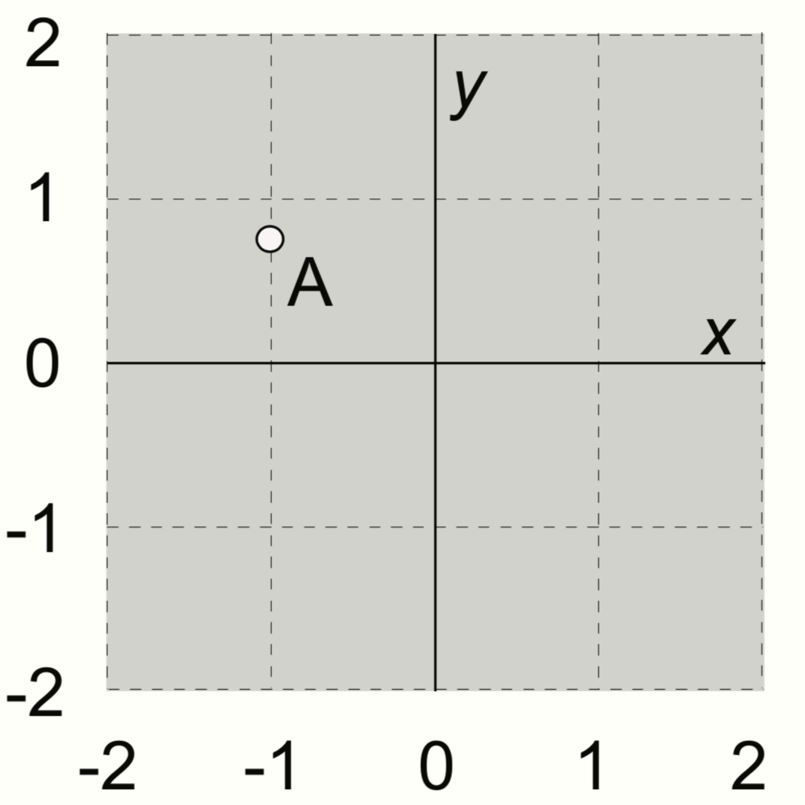


(a) The white dot labeled A is a point with coordinates *x* = –1.0 and *y* = 0.8.



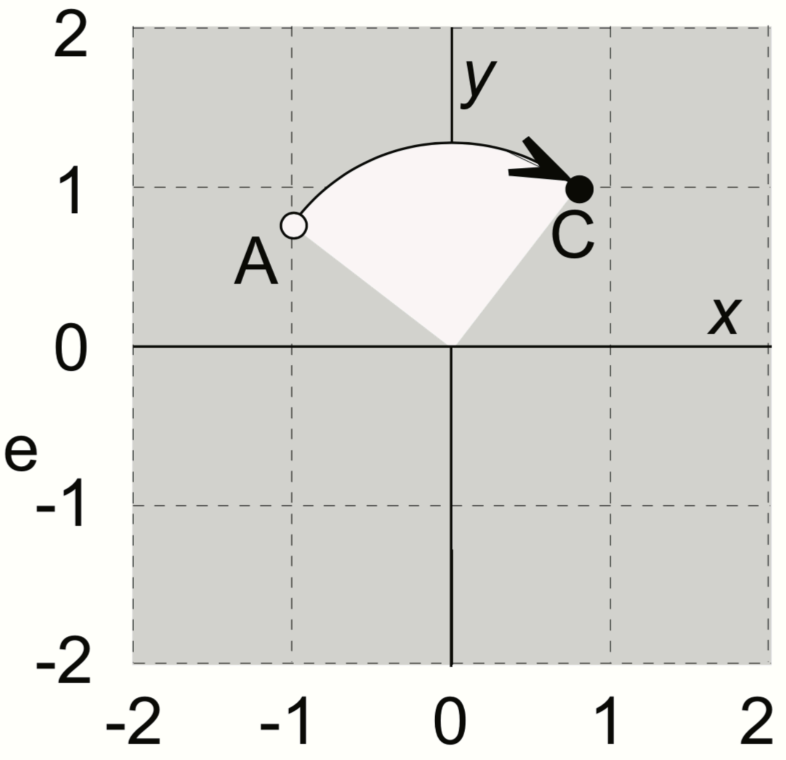
(b) The black dot labeled B was obtained by shifting point A by 1.3 units along the *x* axis and by –1.4 units along the *y* axis. The coordinates of point B are *x* = 0.3 and *y* = –0.6.

The point class (Chapter 2, section 2.4)



(a) The white dot labeled A is a point with coordinates *x* = –1.0 and *y* = 0.8.

(c) The black dot labeled C was obtained by rotating point A 90° in a clockwise direction around the origin. The coordinates of point C are *x* = 0.8 and *y* = 1.0.



Overloading Binary Comparison Operators

We would like to be able to compare two objects of the class using the following operators

==

!=

and possibly others

```
double distance(const point & p1, const point &p2){
    if(p1 == p2)
      return 0;

}
```

Overloading Binary Arithmetic Operators

We would like to be able to add two points as follows

```
point p1, p2;
point p3 = p1 +p2
```

Overloading input/output stream

- Wouldn’t it be convenient if we could do this:

```
point p(10, 10);
cout<<p;
```

And this….

```
point p;
cin>>p; //sets the x and y member variables of p based on user input
```

Next time

- Linked-lists (Chapter 5)