

Proficiency Exam
20 points possible

1. (2 pts) Discuss the difference between pass by value and pass by reference, if there is one.

2. (3 pts) What are the 3 protection levels available for class member functions and variables?

3. (5 pts) Write a recursive function to return the maconacci value of a number. The maconacci of a number is defined as follows: **(Syntax will be graded)**

$$\text{maconacci}(0) = 1$$

$$\text{maconacci}(1) = 3$$

$$\text{maconacci}(2) = 3$$

$$\text{maconacci}(x) = \text{maconacci}(x-1) * \text{maconacci}(x-2) + \text{maconacci}(x-3)$$

4. (4 pts) Given the following snippet of code:

```
int* x = new int;  
int y = *x;  
int* z = &y;  
y = 10;  
int a = *z;  
(*x) ++;  
(*z) --;  
int* b = 0;
```

Describe what the following statements will produce (either what will be printed or what will happen). If a memory address is printed, be as specific as you can by telling me what variable/value the memory address is associated with.

a) `cout << x << endl;`

b) `cout << *x << endl;`

c) `cout << y << endl;`

d) `cout << &y << endl;`

e) `cout << z << endl;`

f) `cout << *z << endl;`

g) `cout << a << endl;`

h) `cout << *b << endl;`

5. (6 pts) Write a function to reverse the elements in an array. You must do this in place, meaning you may not create another array to assist you. Pass in the array and its size as a parameter to your function. **(Syntax will be graded)**