Math 211 Midterm

March 2, 1998

On my honor, I have abided by the code of honor and have committed no act of academic dishonesty on this examination.

Name: _____

Problem 1.(10pts.) The Fibonacci numbers are defined by the formulae $F_0 = 1$, $F_1 = 1$, and $F_{n+1} = F_n + F_{n-1}$. Write a function to compute the nth Fibonacci number. Specifically, write a function with declaration `long Fib(short n);` which takes the number n as input and returns F_n.

Problem 2.(10pts.) The statements below represent part of a long program. The `for` loop was intended to execute three times (with `index` 1/3, 2/3 and 1) and then move on. In fact, it is an infinite loop. Why?

```
        .
        .
        .
   float index;
        .
        .
        .
   for( index=0.0 ; index!=1.0; index+=1.0/3.0 ) {
        .
        .
        .
               }
        .
        .
        .
```

Problem 3.(10pts) Below is code for three versions of a function. Which of them compile and which do not. Why? (Remark: The function doesn't actually do anything interesting.)

A.
```
float AA(short n);
float AA(short n) {
        float v[20];
        n=n+1;
        return (v[n]);
}
```

B.
```
#define AARDVARK 20
float AA(short n);
float AA(short n) {
        float v[AARDVARK];
        n=n+1;
        return (v[n]);
}
```

C.
```
float AA(short n);
float AA(short n) {
        float v[n+2];
        n=n+1;
        return (v[n]);
}
```

Problem 4.(10pts.) After the following declarations and code, what is the value of k?

```
short i, j k;
i=1; j=3; k=2;
i++; j+=k;
k=i*j; k--;
```

Problem 5.(10pts) What value is in x after the statement x=ARD(1.3, 2.4, 6); is executed, where ARD is defined as follows:

```
short ARD(float x, float y, short n);
short ARD(float x, float y, short n)
{
        float tmp;
        tmp=x+y; tmp+=x/y;
        n+=n;
        return (n);
}
```

Problem 6.(10pts) Write the `for`–loop below as a `while`–loop. Assume `x`, `y` and `i` have been declared and assume that they all are used in the "**Some Code**" part of the loop.

```
for( i=0, y=1.2; i<33; i+=2, x=x*x+1) {


        Some Code


}
```