CS 2073
Quiz 1
Introduction to C

_____, _____

Last Name **First Name and Initial**

1. Complete the C program below so that it will use the formula $V = \frac{4}{3}\pi r^3$ to calculate the volume V of a sphere of radius r. (Be careful in translating this formula into C.) Then print the value with 5 digits to the right of the decimal point.

```
#include <stdio.h>
int main() {
   double r = 4.2; /* sorry for typo, putting V instead of r */
   /* put answer below */
   double pi = 3.14159265358979; /* don't need this many digits */
   double V;
   V = (4.0/3.0)*pi*r*r*r; /* note: (4/3) == 1 */
   printf("V = %.5f\n", V); /* or %0.5f or %9.5f etc. */
}
```

2. What values will be printed by the following program? (Show your work.)

```
#include <stdio.h>
int main() {
   int a, b; /* remember: a and b are integers */
   a = 2 + 3*4;
   printf("a = %d\n", a);
   b = 2*3 + 15%4 + 1/4;
   printf("b = %d\n", b);
}
```

```
a = 2 + 12 = 14
b = 6 + 3 + 0 = 9
```

(15%3 = remainder when 15 is divided by 3)
(1/4 is integer division, so it is 0)

3. Consider the following C program:

```
#include <stdio.h>
int main() {
   int income, tax;
   scanf("%d", &income);
   tax = 500;
   if (income < 8000) tax = 1000;
   else if (income <= 10000) tax = 1500;
   else if (income <= 12000) tax = 2000;
   else tax = 2500;
   printf("Income: %d, tax: %d\n", income, tax);
}
```

   a. What will this program print if we type "11000" for the input?

```
Income:  11000, tax:  2000
```

   b. One part of the program has no effect on the value printed, no matter what the value of **`income`** is. What is this part?

```
tax = 500;
```

   c. Fill in values of **`tax`** for the given ranges at the right:

income	tax
< 8000	1000
8000 – 10000	1500
10001 – 12000	2000
> 12000	2500