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.

```c
#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.)

```c
#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:

```c
#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:

<table>
<thead>
<tr>
<th>income</th>
<th>tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 8000</td>
<td>1000</td>
</tr>
<tr>
<td>8000 – 10000</td>
<td>1500</td>
</tr>
<tr>
<td>10001 – 12000</td>
<td>2000</td>
</tr>
<tr>
<td>&gt; 12000</td>
<td>2500</td>
</tr>
</tbody>
</table>
```