Problem 1  Write a complete C++ program that does the following.
1. It asks the user to enter a decimal number that is greater than 0 and less than 10.
2. If the entered number is not within the desired range the program exits.
3. Otherwise the program prints the square of the number.
Here is an example of how the program should work:

Enter a number greater than 0 and less than 10: 2.5
The square is: 6.25

Answer:

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

int main() {
    double number;
    cout << "Enter a number greater than 0 and less than 10: ";
    cin >> number;
    if (number <= 0 || number >= 10) exit(1);
    cout << "The square is: " << number * number << endl;
    return 0;
}
```

Problem 2  Write C++ statements to carry out the following tasks. Do not write complete programs, just give
a single line, or a few lines of C++ instructions.
(a) Print to the screen the message:

2 + 2 = 5

```cpp
cout << "2 + 2 = 5" << endl;
```

(b) Print all the odd numbers from 1 to 1000 to the screen (one number per line).

```cpp
for (int i = 1; i <= 1000; i++)
    if (i % 2 == 1) cout << i << endl;
```

(c) Ask the user enter a number that is not a multiple of 10. If the user gives an incorrect response force the user to
keep entering a number until legal answer is received.

```cpp
cout << "Enter a number that is not a multiple of 10: ";
int number;
cin >> number;
while (number % 10 == 0) {
    cout << "That's a multiple of 10. Try again: ";
    cin >> number;
}
```

(d) Ask the user to enter a number and print its square root if it is positive. (Otherwise do not print anything.)

```cpp
cout << "Enter a positive number: ";
double x;
cin >> x;
if (x > 0) cout << sqrt(x) << endl;
```
(e) Read an integer greater than 2 from the user, then print it in reverse. (If the user enters the number 125, the program should print 521.)

```cpp
int n;
cout << "Enter a number greater than 2: ";
cin >> n;
while (n > 0) {
    cout << n % 10;
    n = n / 10;
}
cout << endl;
```

Problem 3 Consider the following C++ program. Write exactly what output is produced in response to the given user inputs.

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

int main(){
    int age;
    string name;
    cout << "Please enter your name and age: ";
    cin >> name >> age;

    if (name == "Kamil") exit(0);
    if (age < 0) {
        name = "Kamil";
        age = 5;
    }
    if (name == "Peter") {
        cout << "You rat!" << endl;
        return 0;
    }
    if (age >= 100) {
        cout << "Goodbye Kamil!" << endl;
    } else {
        cout << " Hello " << name << " you are about " << age << endl;
        return 0;
    }
}
```

(i) The user enters: Freddy 17

Hello Freddy you are about 17

(ii) The user enters: Peter 19

You rat!

(iii) The user enters: Kamil 19

(iv) The user enters: Andrew -20

Hello Kamil you are about -20

(v) The user enters: Carl 200

Hello Kamil you are about 200
Problem 4   Write a complete C++ program that does the following. (Programs that correctly carry out some of the tasks will receive partial credit.)

The program prints a table with 100 lines of output. On output line number \(x\) the program should list the first \(x\) odd numbers.

For example, the first 4 lines of output read as follows:

1
1 3
1 3 5
1 3 5 7

Answer:

```cpp
#include <iostream>
using namespace std;
int main() {
    for (int r = 1; r <= 100; r++) {
        for (int c = 1; c < 2*r; c += 2)
            cout << c << " ";
        cout << endl;
    }
    return 0;
}
```