#1. (Taken from practice problems for midterm, problem #26)
Write a complete C++ program that does the following:
(1) The program asks the user to enter an integer between 100 and 200.
(2) If the user enters an illegal number, the program repeatedly asks the user to correct their number.
(3) If the user has not entered a correct number after 3 attempts, the program exits.
(4) The program repeatedly generates and prints random numbers between 1 and 1000 until it generates the user’s number when it stops.

An example run of the program follows.
Enter an integer between 100 and 200: 100
Random numbers: 7 873 924 428 100

#2. (Taken from different practice problems for midterm)
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.

(i) Print to the screen the message:
\[ 1 \times 2 \times 3 \times 4 = 24 \]

(ii) Print a random number \( r \) with \( 11 \leq r \leq 29 \). (An appropriate C++ function must be used to make the random number.)

(iii) Print the sum of the square roots of 11 and 12.

(iv) Ask the user to enter their age. If their answer does not satisfy \( 0 \leq \text{age} \leq 1000 \) exit the program immediately.

(v) Print to the screen every four digit number \( n \) that is divisible by both 6 and 10. Print one number per line. (For example 6000 would be printed but 5999 would not be printed since \( 6000 = 6 \times 1000 = 10 \times 600 \).

(vi) Print the numbers from 1 to 1000 to the screen, one number per line.

(vii) Print the even numbers from 2 to 400 to the screen, one number per line.

(viii) Print every three digit number \( n \) for which the next to last digit of \( n^2 \) is 2. For example, 111 is printed because 1112 = 12321. (This number ends in the digits 21 and its next to last digit is 2.)

(ix) Calculate \( x \) as the decimal that represents the fraction \( 1/7 \).

(x) 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.)