Do your answers on the answer sheets provided. When you write code, you do not need to have "include" or "using" statements.

**Question 5**

Your job is to write the procedure `int RB(int r, int b, vector <int> &N)`. The procedure works as follows. Each element of \( N \) is a number of balls, which are either all red or all blue. The problem is, you don't know which color they are. Your program should return 1 if it is possible for the vector to represent exactly \( r \) red balls and \( b \) blue balls. It should return 0 if it is impossible.

For example, \( \text{RB}(6, 7, \{4, 2, 4, 3\}) \) should return 1, and \( \text{RB}(6, 8, \{4, 2, 4, 3\}) \) should return 0. \( \text{RB}(6, 7, \{4, 4, 4, 1\}) \) should return 0 as well.

Constraint #1: \( N \) will have a maximum of 20 elements.
Constraint #2: Each element of \( N \) will be less than 200,000,000.
Constraint #3: No constraints on \( r \) or \( b \).

Before writing this procedure, I want you to do the following:

- Outline your solution in English, rather than writing code.
- If this were a topcoder problem, \( N \)'s size could not be much bigger than this. Maybe 21 or 22. Why?
- Finally, code up your solution.

**Scratch Space is Below (You may find the following useful):**

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |