

# Project Euler #121: Disc game prize fund

This problem is a programming version of [Problem 121](#) from [projecteuler.net](#)

A bag contains one red disc and one blue disc. In a game of chance a player takes a disc at random and its colour is noted. After each turn the disc is returned to the bag, an extra red disc is added, and another disc is taken at random.

The player pays £1 to play and wins if they have taken more blue discs than red discs at the end of the game.

If the game is played for four turns, the probability of a player winning is exactly  $11/120$ , and so the maximum prize fund the banker should allocate for winning in this game would be £10 before they would expect to incur a loss. Note that any payout will be a whole number of pounds and also includes the original £1 paid to play the game, so in the example given the player actually wins £9.

Find the maximum prize fund that should be allocated to a single game in which  $N$  turns are played.

## Input Format

The first line of input contains  $T$ , the number of test cases.

Each test case consists of a single line containing a single integer,  $N$ .

## Constraints

$$1 \leq T \leq 64$$

$$1 \leq N \leq 64$$

But for test cases worth half the total score,  $N \leq 16$ .

## Output Format

For each test case, output a single line containing a single integer, the answer for that test case.

## Sample Input

```
1
4
```

## Sample Output

```
10
```

## Explanation

The case  $N = 4$  corresponds to the example given in the problem statement.

