

# Another Dice Game

**Problem ID:** anotherdice**CPU Time limit:** 1 second**Memory limit:** 1024 MB**Difficulty:** 3.7

In the game *Pickomino*<sup>1</sup> one has to throw 8 dice to reach at least a certain target score. The rules are as follows:

- The dice contain the values 1, 2, 3, 4, 5 and worm. The dice are fair, so all outcomes are equally likely.
- The game is started by throwing all dice.
- After a throw, the player must pick one of the six possible values and put all dice with this value aside. There must be at least one die with this value.
- After putting some dice aside, the player may choose to either throw the remaining dice again or stop. The player may only stop after at least one worm has been put aside.
- Each possible value may only be chosen once during the game.
- When the player stops, his total score is the sum of the values of the dice that were put aside. A worm is worth 5 points.
- The player can get stuck by throwing only values that were already put aside, by having put all dice aside but not having a worm or by not having reached the target score.
- If the player is stuck he scores 0 points and the game is ended.

Jan is playing *Pickomino* and wants to score at least  $n$  points. When Jan uses an optimal strategy, what is the probability that he reaches this target?

## Input

On the first line one positive number: the number of test cases, at most 100. After that per test case:

- one line with the integer  $n$  ( $1 \leq n \leq 40$ ): the target value.

## Output

Per test case:

- one line with a floating point number: the probability that you score at least  $n$  points when using an optimal strategy.

This number should be accurate up to  $10^{-6}$  relative or absolute precision.

### Sample Input 1

```
3
5
21
40
```


### Sample Output 1

```
0.9934260978934218
0.8930267371507457
0.0001461079070016448
```

## Footnotes

1. Dutch people may know this game as *Regenwormen*

**Source:** Benelux Algorithm Programming Contest (BAPC) 2012

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