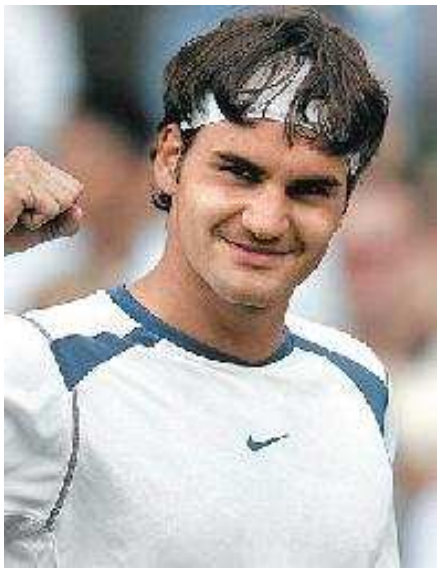
Problem J- Tennis probability



You know how a *game* is scored in tennis? A game consists of *points*. A point is started with a serve and continues until one of the players fails to return the ball properly. The first player to score four or more points, while leading by at least two, wins the game. (As an aside, a tennis match consists of sets, which consist of games, but we are only concerned with games in this problem).

Suppose you are watching a tennis match and you know the probability that your favorite player will win a point against his current opponent. You assume that all points are independent (the player does not get discouraged after a long losing streak and vice versa). What is the probability that the player will win a game?

Input Specification:

The first line of the input contains a nonnegative integer $T \leq 100$, the number of test cases to follow. Each of the next T lines contains a single floating point number p the probability that the player will win a point ($0 \leq p \leq 1$).

Output Specification:

For each test case, print one line: the probability that the player will win a game, to 7 decimals. The absolute error in the answer must not be greater than 10^{-6}.

Sample Input:

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2
0
1.0
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Sample Output:

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0.0000000
1.0000000
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