Problem G: Returning Papers

Filename: `papers`

Time limit: `1 second`

Points: 15

Arup is upset at his classes because not enough people attend lecture. In particular, his main pet peeve is when he tries to return papers in class and students aren't there to receive them. He has been very transparent about this pet peeve and is considering adding incentives/penalties in his future syllabi to ensure that papers get picked up promptly. Over the last two weeks in particular, he's wondered:

If a class has n students total, of which a are in attendance on a particular day, if he has p papers to return to p distinct students, what is the probability that exactly s of those p students are in attendance? (For example, in COT 3100 the other day, in a class where 115 students are on the active roster, 44 attended class. Arup had 11 papers to return, of which only 2 were collected. Thus, for this example, $n = 115$, $a = 44$, $p = 11$, and $s = 2$.)

To answer the question, assume that the probability of each combination of a students out of n total students attending is equally likely and that each set of p papers out of n total papers that could be returned is equally likely.

The Problem

Given the values of n, a, p and s described above, let the probability of the scenario occurring be c/d as a fraction in lowest terms.

Since c and d could be quite large, determine the value of $c(d^{-1} \bmod 10^9 + 7) \bmod 10^9 + 7$.

The Input

The first line of input will contain a single integer t ($1 \le t \le 20$), representing the number of input cases to process.

Each input case will be on a single line with the four integers, n ($1 \le n \le 300$), a ($1 \le a \le n$), p ($1 \le p \le n$), and s ($0 \le s \le p, s \le a, p-s \le n-a$), separated by spaces.

The Output

For each test case, on a line by itself, output the value of $c(d^{-1} \bmod 10^9 + 7) \bmod 10^9 + 7$, where c/d as a fraction in lowest terms is the probability of the scenario specified occurring.

Sample Input	**Sample Output**

`2`
`10 4 4 1`
`115 44 11 2`
	`380952384`
	`645580095`