Central binomial coefficients

[Award] **8 pts**

[Category] **Math**

The binomial coefficients can be arranged in triangular form like this:

**1**

1 1

1 **2** 1

1 3 3 1

1 4 **6** 4 1

1 5 10 10 5 1

1 6 15 **20**  15 6 1

1 7 21 35 35 21 7 1

......

It is known as Pascal's triangle.

The middle coefficients of the even-numbered rows (row numbering starts from zero) form a sequence *an* (*n* >= 0): 1, 2, 6, 20, 70, 252, 924, 3432, 12870, 48620, 184756, …. It has been proven that no number *an* with *n* > 4 is squarefree.

Let *f*(*n*) be *n* divided by largest [squarefree](https://en.wikipedia.org/wiki/Square-free_integer) divisor of *n*. For example, 24 = 23·3 and its largest squarefree divisor is 6, so *f*(24) = 24/6 = 4.

Let *S*(*N*) be the sum of all *f*(*an*) for *n* from 1 to *N*. You are given S(10) = 1 + 1 + 2 + 1 + 6 + 2 + 4 + 3 + 2 + 2 = 24, S(100) = 429083 and S(103) mod 1000000007 = 258384246.

Find S(106) mod 1000000007.

[Answer] **42229311**