

Bernoulli numbers

Your task is to compute natural logarithm of the absolute value of the [Bernoulli number](#) for many integer parameters N .

I/O format is the same as in [BINARYIO](#).

Input

Array of unsigned 32 bit integers in binary format (use [fread](#) in C/C++)

To read *unsigned N* use `fread(&N, sizeof(N), 1, stdin)` instead of usual `scanf("%u", &N)` until the end of file.

For each test case $2 \leq N < 2^{32}$, N is even. There will be up to 1,250,000 numbers in input file.

Output

Array of [doubles](#) in binary format (use [fwrite](#) in C/C++)

To write *double a* use `fwrite(&a, sizeof(a), 1, stdout)` instead of usual `printf("%lf\n", a)`.

For each N output $\ln(|B_N|)$ with absolute or relative error less than 10^{-15}

Example

Input:

4

10

50

Output:

-3,4011973816621553754132366916069

-2,580216829592325170273661603119

57,277060811865704087099873424857

Sample input and output are readable for your convenience!!!

TL = 5 * My time