Integrals

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

You are requested to compute the integral of a black box function.

The function would be supplied to you at the compile time in the form of a header file `blackbox.h`.

At the very beginning of your program you should read single integer n from the standard input call the function `blackbox_init(`n`)`. `blackbox_init` should only be called once. All other functions should only be called after `blackbox_init`. Calling `blackbox_init` with argument different from the one supplied via standard input leads to undefined behaviour.

When you want to get the value of the function at point x you should call `blackbox(`x`)`. This function is guaranteed to be thread-safe. x should be in range $[-1; 1]$.

If you want to get the maximum absolute value of the k-th derivative of the black box function on the integration interval (M_k), you should call `blackbox_df(`k`)`. The k should be integer from 1 to 6.

To check if the black box function is oscillating you should call `blackbox_period()`. The returned value would be the period length if the function is oscillating, and 0 otherwise.

The integration interval is $[-1; 1]$. The required absolute precision is 10^{-9}.

The truncated `blackbox.h` file (implementing only one of possible blackbox functions) and an example (suboptimal) solution `solution.cpp` are available to you on the "Files" tab in PCMS.

You should only submit your `solution.c`/`solution.cpp` file. The appropriate `blackbox.h` will be supplied by the testing system.

You should not try to reverse-engineer the black box and/or interact with it in any way except through the four functions listed above.

Input

single integer: the initializer value for the black box

Output

single double-precision floating point number: the value of the integral of black box function over $[-1; 1]$.