

11302 Hexadecimal Digits of an Integral

Compute the n -th digit, in the hexadecimal expansion of the following expression.

$$\left(\int_0^1 36 \left(\prod_{k=1}^{\infty} \frac{2}{2^k \sqrt{2} + 1} \right)^2 - 48(x+1)^{-1} \sum_{k=0}^{\infty} \frac{(-1)^k}{k+1} x^{2k+2} dx \right)^{1/2}$$

In other words, if the expression is equal to $n_1.n_2n_3\dots n_k\dots$ in hexadecimal. Given k , output n_k . Each digit is an element of $\{1,2,3,4,5,6,7,8,9,A,B,C,D,E,F\}$. For example, the hexadecimal expansion of $1/11$ is $0.0F0F0F0F0F\dots$

Input

The input will consist of at most 50 lines with the value of k ($k < 1000001$) on each line.

Output

For each line of input, output the hexadecimal digit on a single line.

Sample Input

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100
200
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Sample Output

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A
4
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