# Amalgamated Artichokes Price Drop Problem

Clare Assisi is an analyst at Amalgamated Artichokes (AA). As with any company, AA has had some very good times as well as some bad ones. Clare does trending analysis of the stock prices for AA, and she wants to determine the largest decline in stock prices over various time spans. For example, if over a span of time the stock prices were 19, 12, 13, 11, 20 and 14, then the largest decline would be 8 between the first and fourth price. If the last price had been 10 instead of 14, then the largest decline would have been 10 between the last two prices. Clare has done some previous analyses and has found that the stock price over any period of time can be modeled reasonably accurately with the following function:

$$\text{price}(k) = p \cdot (\sin(a \cdot k + b) + \cos(c \cdot k + d) + 2) \text{ where } p, a, b, c \text{ and } d \text{ are constants.}$$

Clare would like you to write a program to compute the largest price decline.

Problem

In this problem, you will first be given the value of the five constants. You will also be given the extent of the time period to examine. For the constants in the first sample run (on the next page), the prices are shown in the graph below. [Note that only the points with integer x-coordinates (those with dots on them) will matter for the solution of the problem].
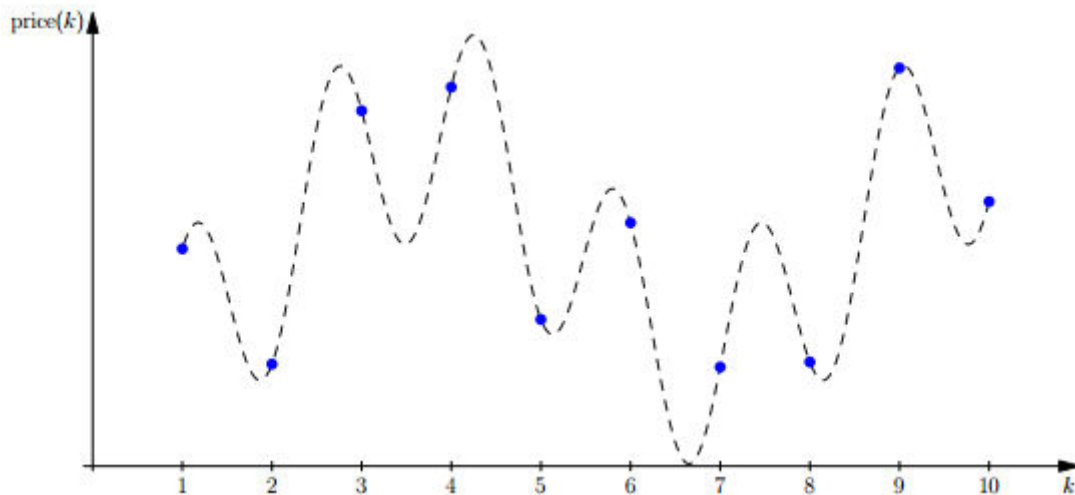
Input

The input consists of a single line of text containing six integers, p, a, b, c, d, and n. The first five are described above. The sixth represents the range of inputs to the price function; the values to consider are price(1), price(2), … , price(n). p will be between 1 and 1000 inclusive. a, b, c, and d will be between 0 and 1000 inclusive. n will be between 1 and 500,000 inclusive.

Output

The output consists of a single number representing the largest price decline over the time interval specified. If there is no decline, the value 0 is shown. Your answer must be accurate to (at least) three decimal places.

Example

Input

```
42 1 23 4 8 10
100 7 615 998 801 3
100 432 406 867 60 1000
```

Output

```
104.855110477
0.00
399.303813
```

Mathematical Note: The `Math.sin()` and `Math.cos()` functions will guarantee more than sufficient precision for the problem. Input units for those functions are the same as the units in Clare's formula.