

## SPOJ Problem Set (classical)

### 3505. Prime Number Theorem

#### Problem code: CPRIME

English

Vietnamese

In number theory, the Prime Number Theorem describes the asymptotic distribution of prime numbers. Let  $p(x)$  be the number of prime numbers not greater than  $x$ . The Prime Number Theorem states that:

[IMAGE]

Your task is to write a program to verify how well the Prime Number Theorem can estimate  $p(x)$ . To be more precise, for a given  $x$ , you have to calculate the percent error  $|p(x) - x/\ln x| / p(x) \%$ .

#### Input

The input contains several test cases (no more than 1000). Each test case contains a value of  $x$  ( $2 \leq x \leq 10^8$ ) given in one line. A number 0 terminates the input.

#### Output

For each value of  $x$ , output the percent error of the estimation of  $p(x)$ , rounded to 1 decimal digit.

#### Example

**Input :**

```
10000000
2
3
5
1234567
0
```

**Output :**

```
6.6
188.5
36.5
3.6
7.7
```

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Added by: Ngô Minh Đu+’c  
Date: 2008-12-11  
Time limit: 20s  
Source limit:50000B  
Languages: All except: ERL TECS JS  
Resource: (c) VNOI