

## 2116 The Mobius Function

The Mobius function  $M(n)$  is defined on positive integers as follows:

$$M(n) = 1 \text{ if } n \text{ is } 1.$$

$$M(n) = 0 \text{ if any prime factor of } n \text{ is contained in } n \text{ more than once.}$$

$$M(n) = (-1)^p \text{ if } n \text{ is the product of } p \text{ different prime factors.}$$

For example:

$$M(78) = -1, \text{ since } 78 = 2 \times 3 \times 13.$$

$$M(34) = 1, \text{ since } 34 = 2 \times 17.$$

$$M(45) = 0, \text{ since } 45 = 3 \times 3 \times 5.$$

Given a value for  $n$  greater than or equal to 1 and less than or equal to 10000, find the value of  $M(n)$ .

### Input

The input consists of a sequence of positive integer values for  $n$  followed by '-1'. The integers are preceded and/or followed by whitespace (blanks, tabs, and ends of lines).

### Output

For each positive integer  $n$ , display the value of  $n$  and the value of  $f(n)$ . Use the format shown in the example below, and leave a blank line between the output for each value of  $n$ .

### Sample Input

```
78
  34      45
    105
  1
      -1
```

### Sample Output

$$M(78) = -1$$

$$M(34) = 1$$

$$M(45) = 0$$

$$M(105) = -1$$

$$M(1) = 1$$