

---

## Solar rocket

P64151\_en

Vint-i-dosè Concurs de Programació de la UPC - Semifinal (2024-06-27)

---

At a planet far away, an alien civilization is developing a rocket that works with solar energy. Assume this simplified model: The rocket is a point that moves vertically. Due to gravity, there is a constant downward acceleration of  $a$  everywhere. At the rocket location, there are  $h$  hours of daytime, followed by  $h$  hours of nighttime, followed by  $h$  hours of daytime, etc. During the daytime hours, the solar engines of the rocket provide an upward acceleration of  $b$ . Will the rocket reach a vertical distance of  $d$ ? If so, can you compute the first time to reach that point?

### Input

Input consists of several cases, each with  $a$ ,  $b$ ,  $h$  and  $d$ . Assume that  $a$  and  $b$  are real numbers such that  $1 \leq a < b \leq 10$ , that  $h$  is an integer number between 1 and 20, that  $d$  is an integer number between 1 and 10000, and that all the units used are km and hours.

### Output

For every case, print "never" if the rocket will never reach height  $d$ . Otherwise, print the minimum time to reach that height, with four digits after the decimal point. The input cases have no precision issues, nor ill-conditioned cases. With the given cases, the answer will never be larger than 200 hours.

### Sample input

```
1 4 3 10
1 4 3 1000
2 5 7 10000
3.1 5.3 12 2000
3.1 5.3 12 200
6.15 9.95 19 1024
3.12 5.96 19 1481
```

### Sample output

```
2.5820
41.8100
183.3596
never
13.7570
25.4604
59.0880
```

### Problem information

Author : Salvador Roura

Generation : 2024-06-27 09:54:49

© Jutge.org, 2006–2024.

<https://jutge.org>