

# Problem 1: Japan is turning footsteps into electricity!

## 3 Points

Problem ID: `piezoelectric`

Rank: 1

## Introduction

Using [piezoelectric](#) tiles, every step you take generates a small amount of energy. Millions of steps together can power LED lights and displays in busy places like [Shibuya Station](#). A brilliant way to create a sustainable and smart city.

Big Ben is road tripping across Japan in his new electric vehicle, but has taken a wrong turn and run out of electricity. Finally putting his doom scrolling to use, he remembers that Japan uses piezoelectric tiles to turn footsteps into electricity! He decides to get out and walk around his car in order to recharge.



## Problem Statement

Big Ben walks along the perimeter of the car to generate his electricity. Assume the car is a rectangle with dimensions  $L$  and  $W$  (given in meters). With each step, Big Ben moves one meter around the car. You are also given  $E$ , the amount of electricity Big Ben needs to generate.

Output the number of laps around the car Big Ben needs to take to fully charge his car if he regenerates  $R$  electricity per step. The number of laps is **guaranteed to be an integer**.

*Note: Templates are available for this problem—and **all other problems in this contest**—in Python, Java, and C++! Find them in the [contest.zip provided at the start of the contest](#). Templates handle input and output for you, so you can just fill out a single function!*

## Input Format

The first line of the input contains a single integer  $T$  denoting the number of test cases that follow. Each test case consists of a single line containing four space-separated integers  $L$   $W$   $E$   $R$  where:

- $L$  denotes the length of the car, in meters.
- $W$  denotes the width of the car, in meters.
- $E$  denotes the amount of electricity Big Ben needs to generate.
- $R$  denotes the amount of electricity generated per step.

## Output Format

For each test case, output a single integer representing the number of laps Big Ben needs to take around his car to generate the necessary electricity  $E$ .

## Constraints

$$1 \leq T \leq 10$$

$$1 \leq L \leq 100$$

$$1 \leq W \leq 100$$

$$1 \leq E \leq 10^4$$

$$1 \leq R \leq 10$$

The number of laps is **guaranteed to be an integer**.

# Sample Test Cases

## Sample Input

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```
3
5 3 128 2
10 5 300 10
2 2 400 5
```

## Sample Output

[Download](#)

```
4
1
10
```

## Sample Explanations

For the first test case, the perimeter of the car is 16 meters. Since  $R = 2$ , each lap generates 32 electricity. Big Ben needs a total of 128 electricity generated, so he must take 4 laps around the car.

For the second test case, a lap generates 300 electricity. Therefore, Big Ben only needs one lap to generate the full 300 electricity.