

# Catch The Train

Problem Code: **CATCHTRA**



Tweet

Like

Share

Be the first of your friends to like this.

You are walking down the escalator to catch a subway train. The escalator itself moves at a speed of **Ve** meters per minute. You can walk down the escalator at a relative speed of **Vy** meters per minute. The length of the escalator is **L** meters. Trains arrive **T** minutes apart. Let **t** be the time between your arrival to the station if you stand still on the escalator and the arrival of the last train before your arrival. Assume that **t** is a random variable uniformly distributed between 0 and **T**. Return the probability of catching an earlier train if you choose to walk down the escalator instead of standing still on it.

**All Submissions**  
(/DI15R079/status/CATCHTRA)

**Successful Submissions**

+

## Input :

The first line of the input contains an integer **Tc** denoting the number of test cases. Each test case contains the following 4 lines

Ve - velocity of escalator

Vy - your relative velocity with the escalator

L - length of escalator

T - Time Period of Trains

## Output

For each test case, output a single line containing the expected probability having an absolute or relative error less than **10^-6**.

<!--

Tips:

- If you have multiple test cases in a file start this section as: "For each test case, output a single line containing..."

-->

## Constraints

- $0 \leq Tc \leq 5 * 10^7$
- $1 \leq Ve \leq 1000$
- $1 \leq Vy \leq 1000$
- $1 \leq L \leq 10^5$
- $1 \leq T \leq 10^6$

## Example

Input :

2  
10  
10  
20  
2  
10  
10  
100  
4

Output :

0.5  
1.0

---

## Explanation

**Example case 1.** If you stand still, it'll take you  $20/10 = 2$  minutes to reach the bottom of the escalator. If you choose to walk, it'll make you  $20/(10+10) = 1$  minute. In the second case you save 1 minute and in 50% of the cases it'll allow you to catch an earlier train.

**Example Case 2.** Here, if you choose to walk instead of stand still, you will save 5 minutes and you will certainly be guaranteed to catch an earlier train.

Author: [directi\\_campus \(/users/directi\\_campus/\)](/users/directi_campus/)

Tags: [directi\\_campus \(/tags/problems/directi\\_campus/\)](/tags/problems/directi_campus/)

Date Added: 8-02-2016

Time Limit: 2 secs

Source Limit: 50000 Bytes

Languages: C, CPP 4.3.2, CPP 6.3, CPP14, JAVA, PYTH, PYTH 3.5

---

## Comments ▶

---

[CodeChef is a non-commercial competitive programming community](#)

[About CodeChef \(http://www.codechef.com/aboutus/\)](http://www.codechef.com/aboutus/) [About Directi \(http://www.directi.com/\)](http://www.directi.com/) [CEO's Corner \(http://www.codechef.com/ceoscorner/\)](http://www.codechef.com/ceoscorner/)

[C-Programming \(http://www.codechef.com/c-programming\)](http://www.codechef.com/c-programming) [Programming Languages \(http://www.codechef.com/Programming-Languages\)](http://www.codechef.com/Programming-Languages) [Contact Us \(http://www.codechef.com/contactus\)](http://www.codechef.com/contactus)

© 2009 Directi Group (<http://directi.com>). All Rights Reserved. CodeChef uses SPOJ © by [Sphere Research Labs \(http://www.sphere-research.com\)](http://www.sphere-research.com)

In order to report copyright violations of any kind, send in an email to [copyright@codechef.com \(mailto:copyright@codechef.com\)](mailto:copyright@codechef.com)

**Directi** (<http://directi.com>)  
Intelligent People. Uncommon Ideas.

The time now is: 10:26:48 PM

Your IP: 123.201.210.10

### [CodeChef \(http://www.codechef.com\)](http://www.codechef.com) - A Platform for Aspiring Programmers

CodeChef was created as a platform to help programmers make it big in the world of algorithms, **computer programming** and **programming contests**. At CodeChef we work hard to revive the geek in you by hosting a **programming contest** at the start of the month and another smaller programming challenge in the middle of the month. We also aim to have training sessions and discussions related to **algorithms**, **binary search**, technicalities like **array size** and the likes. Apart from providing a platform for **programming competitions**, CodeChef also has various algorithm tutorials and forum discussions to help those who are new to the world of **computer programming**.

### [Practice Section \(https://www.codechef.com/problems/easy\)](https://www.codechef.com/problems/easy) - A Place to hone your 'Computer Programming Skills'

Try your hand at one of our many practice problems and submit your solution in a language of your choice. Our **programming contest** judge accepts solutions in over 35+ programming languages. Preparing for coding contests were never this much fun! Receive points, and move up through the CodeChef ranks. Use our practice section to better prepare yourself for the multiple **programming challenges** that take place through-out the month on CodeChef.

### [Compete \(https://www.codechef.com/problems/easy\)](https://www.codechef.com/problems/easy) - Monthly Programming Contests and Cook-offs

Here is where you can show off your **computer programming skills**. Take part in our 10 day long monthly coding contest and the shorter format Cook-off **coding contest**. Put yourself up for recognition and win great prizes. Our **programming contests** have prizes worth up to INR 20,000 (for Indian Community), \$700 (for Global Community) and lots more CodeChef goodies up for grabs.

### [Programming Tools](#)

[Online IDE \(https://www.codechef.com/ide\)](https://www.codechef.com/ide)

### [Practice Problems](#)

[Easy \(https://www.codechef.com/problems/easy\)](https://www.codechef.com/problems/easy)

[Upcoming Coding Contests \(http://www.codechef.com/contests#FutureContests\)](http://www.codechef.com/contests#FutureContests)

[Contest Hosting \(http://www.codechef.com/hostsyourcontest\)](http://www.codechef.com/hostsyourcontest)

[Problem Setting \(http://www.codechef.com/problemsetting\)](http://www.codechef.com/problemsetting)

[CodeChef Tutorials \(http://www.codechef.com/wiki/tutorials\)](http://www.codechef.com/wiki/tutorials)

[CodeChef Wiki \(https://www.codechef.com/wiki\)](https://www.codechef.com/wiki)

[Medium \(https://www.codechef.com/problems/medium\)](https://www.codechef.com/problems/medium)

[Hard \(https://www.codechef.com/problems/Hard\)](https://www.codechef.com/problems/Hard)

[Challenge \(https://www.codechef.com/problems/challenge\)](https://www.codechef.com/problems/challenge)

[Peer \(https://www.codechef.com/problems/extcontest\)](https://www.codechef.com/problems/extcontest)

[School \(https://www.codechef.com/problems/school\)](https://www.codechef.com/problems/school)

[FAQ's \(https://www.codechef.com/wiki/faq\)](https://www.codechef.com/wiki/faq)

## **Initiatives**

[Go for Gold \(http://www.codechef.com/goforgold\)](http://www.codechef.com/goforgold)

[CodeChef for Schools \(http://www.codechef.com/school\)](http://www.codechef.com/school)

[Campus Chapters \(http://www.codechef.com/campus\\_chapter/about\)](http://www.codechef.com/campus_chapter/about)

[Domain Registration in India \(http://www.bigrock.in/\)](http://www.bigrock.in/) and [Web Hosting \(http://www.bigrock.com/web-hosting/\)](http://www.bigrock.com/web-hosting/) powered by BigRock