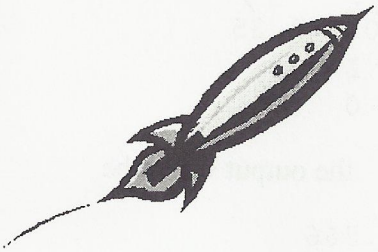
# Problem A: A Most Ingenious Pair a' Twins



One of the intriguing predictions of the Special Theory of Relativity is that time actually slows down for moving objects. We don't normally notice this, because the effect is tiny until you get up to a good-sized fraction of the speed of light (299,792,458 meters per second). So it's not something you will notice on your average drive to and from the supermarket.

The implications of this slowdown of time is often illustrated by the so-called *Twins Paradox*. Imagine two twins, both young adults, one of whom remains on Earth while the other boards a rocket ship that travels at nearly the speed of light for 50 years before returning to Earth. The Earth-bound twin, now a senior citizen after 50 years, is astounded to greet the traveler who has aged only a few years.

The relative time experienced by the two twins is given by the formula

$$t_r = \gamma t_e$$

where $t_r$ is the time experienced by the twin on the rocket and $t_e$ is the amount of time experienced by the twin who remains on Earth. The conversion factor $\gamma$ is given by

$$\gamma = \sqrt{1 - \frac{v^2}{c^2}}$$

where $v$ is the average velocity of the rocket and $c$ is the speed of light (expressed in the same units as $v$).

For example, if $v$ is $259,620,268$ meters per second, then $\gamma = 0.5$ (approximately) and the Earth-bound twin experiences 2 years for every year experienced by the traveler.

Write a program to determine, for two target values of $t_e$ and $t_r$, the average velocity that the rocket would need to travel to produce that difference in time experienced by the two twins.

## Input

Input will consist of one or more datasets. Each dataset will consist of two floating point values on a single line. These values will denote $t_e$ and $t_r$, respectively, expressed in years. You are guaranteed that $t_e \geq t_r$ and that both times will be in the range $1.0 \ldots 100.0$, inclusive.

End of input is indicated by a line containing two zeros.

## Output

For each dataset, print a single line of output containing the desired velocity, expressed in lightyears per year, printed to a precision of 3 decimals.

## Example

Given the input

```
10.5 5.25
5 1
0 0
```

the output would be

```
0.866
0.980
```