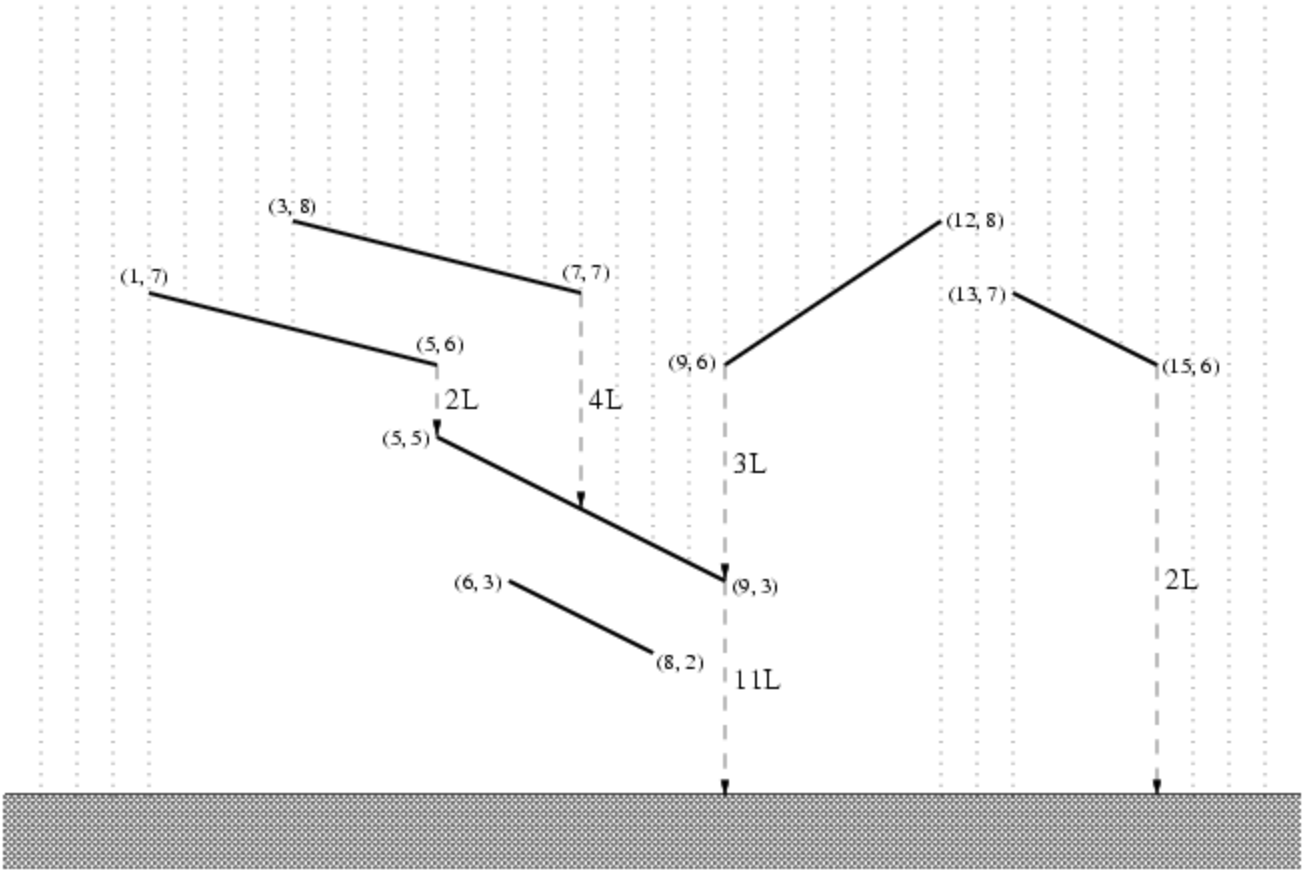
Problem I: Roof

Contemporary buildings can have very complicated roofs. If we take a vertical section of such a roof it amounts to a number of sloping segments. When it is raining the drops are falling down onto the roof straight from the sky above. Some segments are completely exposed to the rain but there may be some segments partially or even completely shielded by other segments. All the water falling onto a segment flows as a stream straight down from the lower end of the segment on the ground or possibly onto some other segment. In particular if a stream of water is falling on an end of a segment then we consider it to be collected by this segment.



For the purpose of designing a piping system it is desired to compute how much water is flowing down from each segment of the roof. To be prepared for a heavy November rain you should count one liter of rain water falling on a meter of the horizontal plane during one second.

1 Task

Write a program that:

- reads the description of the roof from the standard input,
- computes the amount of water flowing down in one second from each segment of the roof,
- writes the result to the standard output.

2 Input

The first line of the input contains one integer n ($1 \le n \le 40\,000$) being the number of segments of the roof. Each of the next n lines describes one segment of the roof and contains four integers x_1, y_1, x_2, y_2 ($0 \le x_1, y_1, x_2, y_2 \le 1\,000\,000, x_1 < x_2, y_1 \neq y_2$) separated by single spaces. Integers x_1, y_1 are respectively the horizontal position and the height of the left end of the segment. Integers x_2, y_2 are respectively the horizontal position and the height of the right end of the segment. The segments don't have common points and there are no horizontal segments. Also you can assume that there are at most 100 segments placed above any point on the ground level.

3 Output

The output consists of n lines. The i-th line should contain the amount of water (in liters) flowing down from the i-th segment of the roof during one second.

4 Example

For the input:

```
6
13 7 15 6
3 8 7 7
1 7 5 6
5 5 9 3
6 3 8 2
9 6 12 8
```

the correct answer is:

```
2
4
2
11
0
3
```

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