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PAINLESS

MinPerimeterRectangle

START

Find the minimal perimeter of any rectangle whose area equals N.

Programming language: C++ ▼

An integer N is given, representing the area of some rectangle.

The *area* of a rectangle whose sides are of length A and B is $A * B$, and the *perimeter* is $2 * (A + B)$.

The goal is to find the minimal perimeter of any rectangle whose area equals N. The sides of this rectangle should be only integers.

For example, given integer N = 30, rectangles of area 30 are:

- (1, 30), with a perimeter of 62,
- (2, 15), with a perimeter of 34,
- (3, 10), with a perimeter of 26,
- (5, 6), with a perimeter of 22.

Write a function:

```
int solution(int N);
```

that, given an integer N, returns the minimal perimeter of any rectangle whose area is exactly equal to N.

For example, given an integer N = 30, the function should return 22, as explained above.

Assume that:

- N is an integer within the range [1..1,000,000,000].

Complexity:

- expected worst-case time complexity is $O(\sqrt{N})$;
- expected worst-case space complexity is $O(1)$.

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