Construct the Rectangle

For a web developer, it is very important to know how to design a web page's size. So, given a specific rectangular web page’s area, your job by now is to design a rectangular web page, whose length L and width W satisfy the following requirements:

1. The area of the rectangular web page you designed must equal to the given target area.

2. The width W should not be larger than the length L, which means L >= W.

3. The difference between length L and width W should be as small as possible.

You need to output the length L and the width W of the web page you designed in sequence.

Example:

```
Input: 4
Output: [2, 2]
Explanation: The target area is 4, and all the possible ways to construct it are [1,4], [2,2], [4,1].
But according to requirement 2, [1,4] is illegal; according to requirement 3,  [4,1] is not optimal compared to [2,2]. So the length L is 2, and the width W is 2.
```

Note:

1. The given area won't exceed 10,000,000 and is a positive integer
2. The web page's width and length you designed must be positive integers.

Solution 1

The W is always less than or equal to the square root of area
so we start searching at sqrt(area) till we find the result

```
public int[] constructRectangle(int area) {
        int w = (int)Math.sqrt(area);
 while (area%w!=0) w--;
 return new int[]{area/w, w};
}
```

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Solution 2

```
public int[] constructRectangle(int area) {
        int[] result = new int[2];
        if(area == 0){
            return result;
        }
        int a = (int)Math.sqrt(area);
        while(area%a != 0){
            a--;
        }
        int b = area/a;
        result[0] = b;
        result[1] = a;
        return result;
    }
```

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Solution 3

```
class Solution(object):
    def constructRectangle(self, area):
        mid = int(math.sqrt(area))
        while mid > 0:
            if area % mid == 0:
                return [int(area / mid), int(mid)]
            mid -= 1
```

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