An array arr is a **mountain** if the following properties hold:

* arr.length >= 3
* There exists some i with 0 < i < arr.length - 1 such that:
  + arr[0] < arr[1] < ... < arr[i - 1] < arr[i]
  + arr[i] > arr[i + 1] > ... > arr[arr.length - 1]

Given a mountain array arr, return the index i such that arr[0] < arr[1] < ... < arr[i - 1] < arr[i] > arr[i + 1] > ... > arr[arr.length - 1].

You must solve it in O(log(arr.length)) time complexity.

**Example 1:**

Input: arr = [0,1,0]  
Output: 1

**Example 2:**

Input: arr = [0,2,1,0]  
Output: 1

**Example 3:**

Input: arr = [0,10,5,2]  
Output: 1

**Constraints:**

* 3 <= arr.length <= 105
* 0 <= arr[i] <= 106
* arr is **guaranteed** to be a mountain array.