

Full Name (Legible Please!) _____

There are two questions. Make sure you have two pages (the second question may be on the back).

Question 1

Write a function to determine if an integer n is prime.

The easiest way to do this is to loop over the numbers from 2 to $\text{Math.sqrt}(n)$, inclusive. If any of these numbers divides n evenly, then n cannot be prime.

You may call $\text{Math.sqrt}(n)$, and you may assume that it is already imported.

Hint: If you have checked all of the numbers from 2 to $\text{Math.sqrt}(n)$, inclusive, and none of them divide n evenly, you know the number is prime.

If n is non-positive, your code should throw an appropriate exception.

```
public static boolean isPrime(int n) {
```

Question 2

This question has two parts.

(a) Write a function that "removes" negative values from an array of doubles.

For example, given the input array [4.5 -4.0 11.0 -3.0 0.0 -5.7 6.0 1.3], the result should be [4.5 11.0 0.0 6.0 1.3].

The array may be empty and it may contain positive elements, negative elements, 0, or some combination thereof. Values may also be repeated.

Throw an appropriate exception if the array argument is null.

You must not modify the input array in your function. You may use no more than two loops. Do not use a *foreach* loop (also known as an *enhanced for* loop), or any data structures from the Java Collections Framework (i.e. in package `java.util.collections`).

```
public static double[] removeNegatives(double[] a) {
```

(b) In part a, the starter code declares that the function's return type is `double[]`. Could the function have simply changed the input array `a` and returned `void`? Why or why not?