U4 Assignment Worksheet: `isPrimeNumber`

1. Prime numbers have exactly two distinct positive divisors: 1 and the number itself. By this definition, negative numbers and the number 1 are considered not prime numbers. Write two methods: first, a method named `isPrimeNumber` that takes in an integer parameter and checks if that number is a prime number, and second, a method named `printPrimeNumbers` that takes in an integer parameter, `n`, and prints out all the prime numbers up to and including `n`. The method `printPrimeNumbers` must call method `isPrimeNumber` to determine if each number is a prime number or not. Note that for checking if a number is prime, you only need to check for factors up to (and including) the square root of the number. For your own knowledge, you should try to consider why this works.

   Write the code in your computer, test it, and then accurately reproduce both methods in their entirety below.

```
public static void printPrimeNumbers(int max) {
    for(int i = 2; i <= max; i++) {
        if(isPrimeNumber(i)) {
            System.out.print(i + " ");
        }
    }
}

public static boolean isPrimeNumber(int n) {
    if(n<2) {
        return false;
    }
    int max = (int) Math.sqrt(n);
    for(int i = 2; i <= max; i++) {
        if(n%i == 0) {
            return false;
        }
    }
    return true;
}
```