You must write Java or C++ on the first page of your answers!! You may answer the questions using either Java or C++, but you must use the same language for each question on the exam.

1. **(2 pts)** Write a function named `triangle` to output the following pattern:

```
*  
** 
*** 
**** 
***** 
****** 
*******
```

Your function should have one parameter, `x`, which denotes the number of rows (and columns) to be printed. The pattern above is for `x=7`.

2. **(2 pts)** Write a recursive function named `isSorted` that takes an array `a` containing values of type double and its size and returns true if the array is sorted in ascending order, and false if any of the elements is out of order. In other words, `a[i] <= a[i+1]` must be true for all the elements. Note: a 1 element array is sorted, by definition (a 0 element array is sorted as well).

3. **(2 pts)** Given a binary search tree class defined as follows:

```java
// Java
class BST {
    private class TreeNode {
        int value;
        TreeNode left;
        TreeNode right;
    }
    private TreeNode root;
    public BST() {root = null;}
    public boolean find(int x) {...}
}
```
Write the member function `find(int x)` which returns true if the value x is in the tree, otherwise false. A binary search tree has the following property: at each node in the tree, the elements in the left subtree are less than the node value, and the elements in the right subtree are greater than the node value. Your solution should take advantage of this property to avoid performing an exhaustive search of the tree. You may add new private functions to the class as needed.

4. **(4 pts)** The equation of a line in standard form is $ax + by = c$, where $a$, $b$, and $c$ are real numbers, and where both $a$ and $b$ cannot both be zero. If $b \neq 0$, then the slope of the line is $-a/b$. If $a = 0$, then it is a horizontal line, and if $b = 0$, then it is a vertical line. The slope of a vertical line is $\infty$ (undefined). Two lines are parallel if they have the same slope or both are vertical lines.

Design and implement the `lineType` class to represent a line. Include the following functions in your class:
- a 3-argument constructor.
- `slope` to compute and return the slope (if the line is nonvertical).
- `isHorizontal` to return `true` if the line is horizontal, `false` otherwise.
- `parallel` to return `true` if the line is parallel to another line, `false` otherwise.

It is ok for `slope` to cause a runtime error if the line is nonvertical. It is NOT ok for `parallel` to cause a runtime error.