Section Activity #10: Preinpost Traversal

Your Names: ____________________________________________

Directions: In groups of two (or three, if need be), complete the following activity. This section activity will be graded; all students in the group will receive the same score. Make sure that the names of all group members are on the page you submit to your section leader.

Background: Imagine performing all three traversals (preorder, inorder, and postorder) at the same time in just one recursive method. Let’s call that the preinpost traversal of a binary tree. In terms of the sailing photographers example from class, we take a picture of (e.g., visit) each peak of the island all three times we sail by it. For example, here’s a small binary tree and its preinpost traversal:

```
    W
   / \  Preinpost: W X X W Y Z Z Y W
  X   Y
 /   /
Z
```

Task: Answer the following three questions about preinpost traversals.

1. What is the preinpost traversal of the tree shown below?

```
    M
   /  
  N   
 /     
Q       
/     
P   Q
```

2. When a preinpost order traversal displays a node’s value three times in a row (e.g., X in the example traversal above), what property must the node containing that value possess?

(The final question is on the back . . .)
3. Write a recursive method named `preinpost()` that accepts a `TreeNode` reference and displays to the screen the preinpost traversal of the tree rooted at that node. If the tree is empty, print nothing. Assume that the expected `getData()`, `getLeftChild()`, and `getRightChild()` instance methods are available for `TreeNode` objects.

```java
public void preinpost (TreeNode root) {
}
```