A. Pseudo code of the MergeSortPlus:

```
Algorithm MergeSortPlus (A)
Input: unsorted array A
Output: sorted array A

if (A.length ≤ 20) then
        go to InsertionSort (A)
        return A
(A1, A2) = partision (A, A.length / 2)
MergeSortPlus (A1)
MergeSortPlus (A2)
A = merge (A1, A2)
return A

Algorithm merge (A1, A2)
Input: two arrays A1, A2
Output: M: merged array of A1 and A2

initialize empty array M of size !A1.length + !A2.length
initialize empty array M of size !A1.length + !A2.length
while (!A1.empty & !A2.empty) do
        if (!A1.first ≤ !A2.first) then
                M.addLast(A1.removeFirst)
        else
                M.addLast(A2.removeFirst)

while (!A1.empty) do
        M.addLast(A2.removeFirst)
while (!A2.empty) do
        M.addLast(A1.removeFirst)
return M

Algorithm InsertionSort (A)
Input: unsorted array A
Output: sorted array A

temp = 0
j = 0
for (i = 1; i < A.length; i++) do
        temp = A[i]
        j = i

        while (j > 0 & temp < A[j – 1]) do
                A[j] = A[j – 1]
                j--
        A[j] = temp
```

B. The java code is in the path Problem3/MergeSortPlus.java.

C. The test is in the path Problem3/testMergeSort.java. The test procedure is as follows

1. A number of arrays with sizes of 10, 100, 1000, 10000, 1000000, 10000000 is generated with random element values.
2. Each array is copied twice. One copy is sorted using the merge sort. The other is merged using merge sort plus. Time elapsed is recorded for both.
Test results: time (in mS) was typically the same for array sizes les than 1000 elements. For larger sizes, the merge sort plus was superior by an increasing rate, with a rough average 30% improvement in the running time.
The results are believed to be conclusive because:
1. They cover a large range of array sizes (10 - 10^7)
2. Identical arrays are tested each time for both algorithms. So, the algorithms have equal chances.
3. The test is run using the same IDE and performed using the same java class. Also, they were performed several times and they gave similar results.