

Name \_\_\_\_\_ Period \_\_\_\_\_

**Skill 27.1 Exercise 1**

If an array of Integer objects contain the following elements, what would the array look like after the third pass of selectionSort, sorting from high to low?

89 42 -3 13 109 70 2

```
public class Sorter {
    private Integer[] a;
    public Sorter(Integer[] arr){a = arr;}

    /**Swap a[j] and a[j] in array a.*/
    private void swap(int i, int j){
        /*implementation not shown*/
    }
    /**
     * Sort array a from largest to smallest using selection sort
     * Precondition: a is an array of Integer objects
     */
    public void selectionSort(){
        for(int i = 0; i < a.length-1;i++){
            //find max element in a[i+1] to a[n-1]
            Integer max = a[i];
            int maxPos = i;
            for(int j = i + 1; j < a.length;j++){
                if(max.compareTo(a[j])<0){//max less than a[j]
                    max = a[j];
                    maxPos = j;
                }
            }
            swap(i, maxPos);
        }
    }
}
```

**Skill 27.1 Exercise 1**

An array of Integer objects is to be sorted from biggest to smallest using the insertionSort method. If the array originally contains the integers below, what will it look like after the third pass of the for loop?

1 7 9 5 4 12

```
public class InsertionSort {
    private Integer[] a;
    public void insertionSort(){
        for(int i = 1; i < a.length;i++){
            Integer temp = a[i];
            int j = i - 1;
            while(j >= 0 && temp.compareTo(a[j]) > 0){
                a[j + 1] = a[j];
                j--;
            }
            a[j + 1] = temp;
        }
    }
}
```

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**Skill 27.3 Exercise 1**

Trace the complete execution of the merge sort algorithm when called on the array below. Show the sub-arrays that are created by the algorithm and show the merging of sub-arrays into larger sorted arrays.

```
int[] numbers = {8, 5, -9, 14, 0, -1, -7, 3};  
mergeSort(numbers);
```

<u>Sub arrays created</u>	<u>Merging of sub arrays</u>

**Skill 27.4 Exercise 1**

Given the following list of numbers [14, 17, 13, 15, 19, 10, 3, 16, 9, 12] what are the contents of the list after the second partitioning according to the quicksort algorithm? (Assume the first value in the array is the initial pivot point)

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AP Computer Science A  
Ticket Out the Door  
Set 27: Sorting

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