

Question 3 (10 points)

Complete the following method, which returns a new 2D array of values, the smaller of corresponding values in the two specified 2D arrays.

```
public static float[] [] smaller(float[] [] x, float[] [] y) {
```

```
}
```

Question 4 (5 points)

Java has many standard classes of errors and exceptions.

(a) Give an example of a class that extends `Error`.

Give an example of a class that extends `Exception`.

(b) What is special about classes that extend `RuntimeException`?

Question 5 (10 points)

Given this interface for a function $y(x)$,

```
interface Function {  
    public double y(double x);  
}
```

complete the following classes. Include only the minimal amount of code necessary to implement this interface and any necessary constructors.

```
/** A sine function  $y = \sin(x)$  */  
public class Sine implements Function {
```

```
}
```

```
/** A polynomial function  $y = c[0] + c[1]*x + c[2]*x*x + \dots$  */  
public class Polynomial implements Function {
```

```
    private double[] c; // polynomial coefficients  
}
```

Question 6 (10 points)

For each of the following questions, circle *all (one or more)* correct answers.

- (a) To read binary doubles from a `FileInputStream`, we should construct a
 - A. `FileDataReader`
 - B. `Scanner`
 - C. `DataInputStream`
 - D. `DataOutputStream`

- (b) Which of the following properties apply to text files?
 - A. Contain only alphabetic letters, not numerals.
 - B. Can be viewed easily using any text editor.
 - C. Are usually smaller than binary files.
 - D. Contain bytes that represent characters and digits.

- (c) A program writes one `int` value and three floats to a new binary file. How many bytes are in the file?
 - A. 4
 - B. 8
 - C. 16
 - D. 32

- (d) Why is it important to always close an output stream?
 - A. To erase all of the data in the file.
 - B. To ensure that all data are written to the file.
 - C. To properly initialize all output methods.
 - D. To ensure that no one thinks you an amateur.