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SE333 - Final

1)

Case	Description	Input Value	Expected outcome
1	Equal values	3,3,3	EQUILATERAL
2	Two equal Values	5,5,9	ISOSCELES
3	Different Values	4,5,6	SCALENE
4	One Input	1	NOT A TRIANGLE
5	Two inputs	1,2	NOT A TRIANGLE
6	Over three inputs	1,2,3,4,5	NOT A TRIANGLE
7	$b+c \leq a$	5,3,1	NOT A TRIANGLE
8	$a+b \leq 3$	1,2,3	NOT A TRIANGLE
9	All zeros	0,0,0	NOT A TRIANGLE
10	One zero	0,3,8	NOT A TRIANGLE

2)

```
public class TestCalculation {

    @Test
    public void pass() {
        int arr[] = {10,2,3,5};
        assertEquals(10, Calculation.findMax(arr));
    }
    @Test
    public void fail() {
        int arr[] = {-10,-2,-3,-5};
        assertEquals(-2, Calculation.findMax(arr));
    }
}

public class Calculation {
    public static int findMax(int arr[]){
        int max=Integer.MIN_VALUE; //changed
```

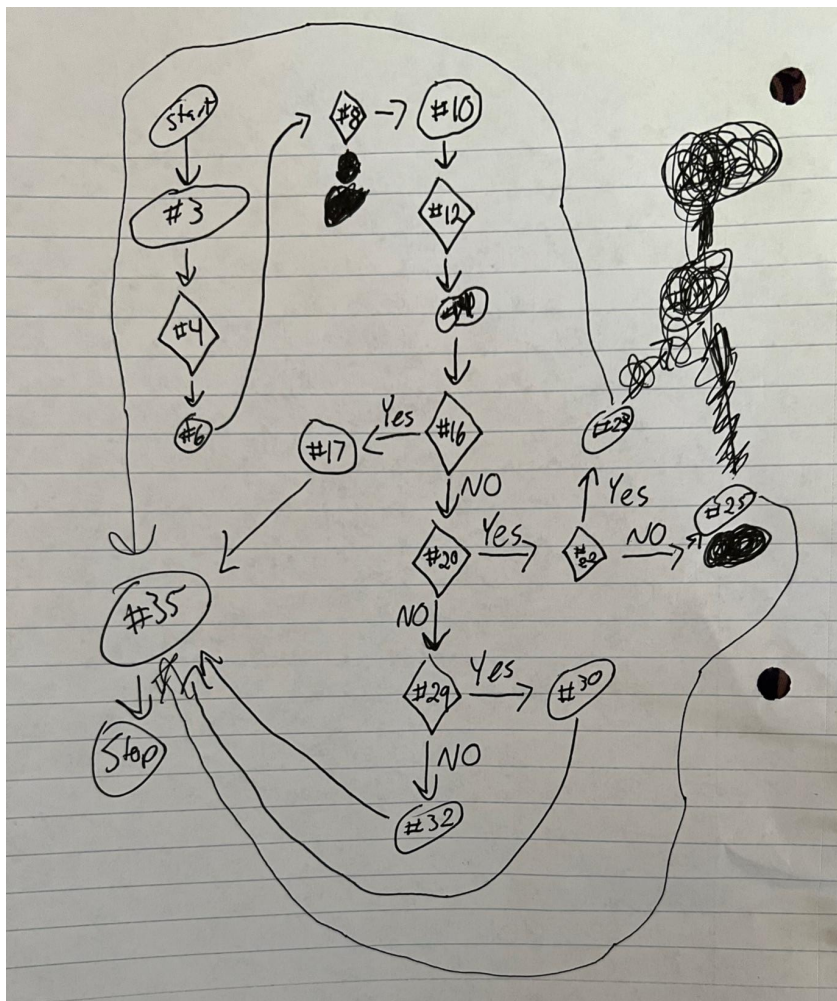
```

    if (arr.length==0)
        return null;//changed
    for(int i=0;i<arr.length;i++){
        if(max<arr[i])
            max=arr[i];
    }
    return max;
}
}

```

3)

'#x', where x equals any number, represents the line number of the code for each node.



# of edges = 22

# of nodes = 19

Edges - nodes + 2 = CC; 22 - 19 + 2 = 5

4)

a) Statement coverage

a=0	b=x	c=x	d=x	e=x
a=1	b=1	c=2	d=3	e=x
a=1	b=x	c=2	d=2	e=x

b) branch coverage

a=0	b=x	c=x	d=x	e=x
a=1	b=1	c=2	d=3	e=x
a=1	b=2	c=2	d=2	e=x
a=2	b=3	c=2	d=2	e=x
a=2	b=2	c=2	d=2	e=x
a=1	b=2	c=2	d=3	e=x

c) condition coverage

100% branch coverage == 100% condition coverage.

5)

- 1) True
- 2) False - The existence of errors detected by test cases in the modules does not necessarily imply the misbehavior of the system is the correct statement.
- 3) False - Testing is for checking if the values returned to the user are valid.
- 4) True
- 5) True
- 6) False - Black box is external testing and white box is internal testing. No relationship between the two.
- 7) True
- 8) False - Testing is done to FIND bugs, errors and defects in code.
- 9) False - code refactoring does not change the code's logic, however, changes the code's readability and maintainability.
- 10) True

6)

1	The tester can be non-technical (doesn't need to have knowledge of the programming language of the software).	B
2	The tester doesn't need to have detailed functional knowledge of the system.	B
3	Helps removing extra lines of code which can bring in hidden defects.	W
4	Tester may reason carefully about algorithmic methods and their implementation.	W
5	Expensive since a skilled tester is needed to carry out this type of testing	W
6	Test cases can be designed as soon as the functional specification is complete.	B

7)

a = -1; checks if the program throws RuntimeException.

a = 0; checks the a == 0 condition - will result in 0 ( $10 \cdot 0 = 0$ ).

a = 1; checks when a > 0 - will result in 10 ( $10 \cdot 1 = 10$ ).

a > 1; checks any value greater than one - result will be 10a.