APCSP-Wilson 2019 (KEY) Name _____

Unit 3 Functions, Parameters, Loops Practice Worksheet

For #1-4, use the following code to answer the questions:

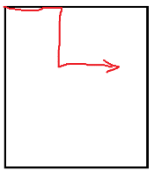
```
1  penUp();
2  moveTo(0, 0);
3  penDown();
4  drawShape(100, 90,"red");
5  function drawShape(sideLength, angle, color) {
6    turnRight(angle);
7    penColor(color);
8    moveForward(sideLength);
9    turnRight(angle);
10   moveForward(sideLength);
11   turnLeft(angle);
12   moveForward(sideLength);
13 }
14
```

1. What is the name of the function created?
   drawShape()

2. How many *parameters* are within the function? What are their names? *3, sideLength, angle, color*

3. What are the values of the *arguments* being passed to this specific function? *100, 90 red*

4. Given that the turtle faces UP (NORTH) originally, sketch the image that is created. Be as specific as possible (location, color, width, length, etc.). If no image is created, explain why not.



For #5-8, use the HTML code (used for creating a website) to answer the following questions.

```
1  <!DOCTYPE html>
2  <html>
3  <head>
4      <title> U3L7 </title>
5  </head>
6
7  <body>
8      <p id="demo"></p>
9      <script>
10         document.getElementById("demo").innerHTML =
11         "The temperature is " + toCelsius(77) + " Celsius";
12
13         function toCelsius(fahrenheit) {
14         return (5/9) * (fahrenheit-32);
15         }
16     </script>
17 </body>
18 </html>
19
```

5. What is the name of the function being defined?

   toCelsius()

6. What is the name of the parameter?

   fahrenheight

7. What is the value of the parameter being passed as input to the function?

   77

8. What value will be *returned* (output) as a result of this function executing? *Feel free to use a calculator.*
   (5/9 *(77-32))

For #9-13, use the HTML code to answer the following questions. Assume that line 1 is the first line of code that you see and line 20 is the last line of given code.

9. In what line is the function defined?

10. In what line is the function called?

```
<!DOCTYPE html>
<html>
<body>

<p>
The global function (myFunction) returns the product of the
arguments (a ,b):
</p>

<p id="demo"></p>

<script>
function myFunction(a, b) {
  return a * b;
}
document.getElementById("demo").innerHTML = myFunction(10, 2);
</script>

</body>
</html>
```

11. What is/are the name(s) of the parameters within the function? How could the name(s) be improved?

a, b – they should be more descriptive

12. What values are being passed to the function as arguments?

10, 2

13. What value will be *returned* (output) as a result of this function executing?

20

14. Which of the following is/are example(s) of a programmer created abstraction?

A. moveForward()
B. moveTo()
C. for (var i=0; i<10; i++) { }
D. drawsquare()
E. function drawSquare() { }

For #15-16, determine what the following code would draw.

15.

```
for (var i = 0; i < 4; i++) {
  moveForward(25);
  turnLeft(90);
}
```

4 move forwards same amount,
4 turn lefts @ 90 degrees
A square

16.

```
for (var i = 0; i < 4; i++)
{
  moveForward(25);
  turnLeft(60);
}
```

4 move forwards same amount,
4 turn lefts at 60 degrees
partial hexagon (incomplete)

For #17-21, use the following code (and output) to the answer the following questions.

```
1  penUp();
2  moveTo(150, 440);
3  penDown();
4  for (var i = 0; i <= 8; i++)
5  {
6    moveForward(i*10);
7    penWidth(1+i);
8  }
```

17. What is the control variable and its initial value?

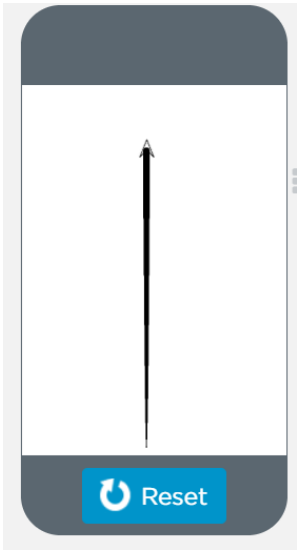
    i

18. What is the control variable comparison?

    i<=8

19. How is the control variable being changed?

    i++



20. How many iterations did this loop run? *Hint: It's not 7.*

    9 times, 0, 1, 2, 3, 4, 5, 6, 7, 8

21. State the value of moveForward and the penWidth for *each* of the iterations.

i	mF	pW
0	0	1
1	10	2
2	20	3
3	30	4
4	40	5
5	50	6
6	60	7
7	70	8
8	80	9

22. How many times will the loop in the code shown below run?

```
1  for (var i = 0; i < 10; i++)
2  {
3    moveForward(i+10);
4    dot(10+i*2);
5  }
6
```

    A. 0
    B. 1
    C. 10
    D. Infinitely many times

23. Which of the following is an infinite loop? **Select ALL possible answers.**

    A. for (var i=0; i < 10; i--) { }
    B. for (var i=0; i <=10; i++) { }
    C. for (var i=10; i >10; i--) { }
    D. for (var i=0; i >10; i++) { }

24. Which of the following loop will not run? **Select ALL possible answers.**

A. for (var i=0; i <10; i--) { }

B. for (var i=0; i <=10; i++) { }

C. for (var i=10; i >10; i--) { }

D. for (var i=0; i >10; i++) { }

For #25-27, determine whether the following statements describe a **function, parameter,** or **loop.**
Select ALL possible answers.

25. Allows you to reduce your lines of code (make more efficient) — FUNCTION PARAMETER LOOP

26. Allows you to manage the complexity of code — FUNCTION PARAMETER LOOP

27. Generalizes solution to a problem without worrying about every little detail — FUNCTION PARAMETER LOOP

For #28-29, there are errors in the following code such that the program does not run as intended. Find and describe the error in the code.

28. Intention: Draw a rectangle

```
1  drawRectangle();
2  function drawRectangle(length, width) {
3    for (var i = 0; i < 4; i++) {
4      moveForward(length);
5      turnRight(90);
6      moveForward(width);
7      turnRight(90);
8    }
9  }
```

Need to loop 2 times not 4

29: Intention: Draw 2 grass strands

```
drawGrass(60,50);
drawGrass(70,100);
function drawGrass(angle,length) {
  arcLeft(10,200);
}
```

need to include parameters in function definition

Challenge: Read the program code below and determine the output. Rather than draw the output (which you are technically unable to do), *explain* the result of the running the program.

Draws 8 buildings of random height and width 25 pixels apart from each other.

```
penUp();
moveTo(9, 250);
penDown();
penWidth(5);
penColor("blue");
drawcity(8);
function drawcity(num) {
  for (var i = 0; i < num; i++) {
    drawBuilding(randomNumber(1, 100), randomNumber(1, 20));
  }
}
function drawBuilding(height, width) {
  moveForward(height);
  turnRight(90);
  moveForward(width);
  turnRight(90);
  moveForward(height);
  turnLeft(90);
  moveForward(25);
  turnLeft(90);
}
```