Name:_______ **SOLUTION** ______ CM: _________ Section: _____ Grade: ________ of 10

Range expressions:

1. What is the output of the following code snippet?

```
for k in range(200, 215):        200  201  202  ... 214
    print(k)                     on separate lines
```

2. Modify the code above so that it also prints the 215 as part of the output.
   Change the 215 to 216.

3. Joe wants his **for** loop to output the numbers counting DOWN from 100 to ***n***, inclusive, for some number ***n*** smaller than 100. He writes:

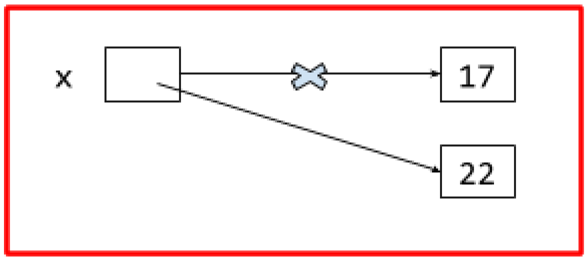
```
for k in range(100, n - 1, -1):
    print(k)
```

He correctly remembered the step of -1, but made another small bug. Find and fix it.
Change the ***n*** to ***n - 1***.

Box and pointer diagrams:

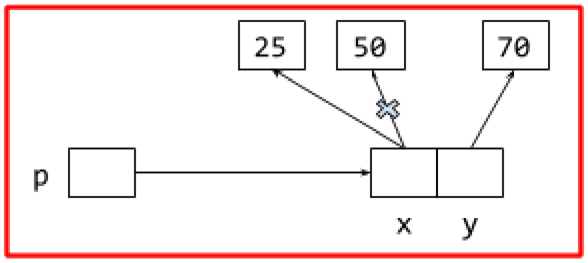
4. Draw a box-and-pointer diagram for the following statements. Recall that you should cross out the arrows rather than erase them:

```
x = 17
x = x + 5
```



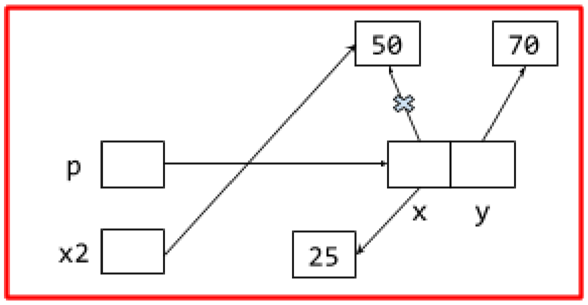
5. Draw a box-and-pointer diagram for the following statements.

```
p = rg.Point(50, 70)
p.x = 25
```



6. Draw a box-and-pointer diagram for the following statements.

```
p = rg.Point(50, 70)
x2 = p.x
p.x = 25
```



What is the value of **x2** after this code runs? ___ **50** _____
Use your box and pointer diagram to help. (Suggestion: ask for the answer to the above and use it to check your diagram.)

7. What gets printed when the code to the right runs?

   999 2

```
class Point(object):
    def __init__(self, x, y):
        self.x = x
        self.y = y

def main():
    point = Point(1, 2)
    blah(point)
    print(point.x, point.y)

def blah(point):
    point.x = 999
    point = Point(33, 44)

main()
```

8. Every object in Python has **two** things: what are they? (Put a mark by TWO of the following items.)

   _____ ***A type***

   _____ ***A value***

   _____ An accumulator

9. In object-oriented programming, you can create custom classes. What is a ***class***?

   _____ A collection of students _____ ***A custom type*** _____ A socioeconomic group

10. What is the name of the ***constructor method*** in Python? (don't forget the underscores) **__init__**

11. Recall that classes have a *name*, *instance variables*, and *methods*. Here (below and to the right) is the definition of part of a simple class that you saw in the video:

```
class Point(object):
    def __init__(self, x, y):
        self.x = x
        self.y = y

    def move_by(self, dx, dy):
        # Location 1
        self.x = self.x + dx
        self.y = self.y + dy
```

   a. Give an example from the code of an ***instance variable***:
      x when used as **self.x**
      y when used as **self.y**

   b. Give an example from the code of a ***method***:
      move_by **__init__**

   c. What is the ***name*** of the class? _____ **Point** __

   d. What ***keyword*** was used to define the class? _ **class**

12. Continuing the previous problem (with its ***Point*** class), consider the two lines of code shown to the right. When those two lines of code run, the execution of the second line brings us to Location 1 (see the *Point* class above to find Location 1). **At Location 1, what are the values of:**

```
p = Point(40, 50)
p.move_by(1, 2)
```

   self ___ The object constructed by **Point(40, 50)**; the object to which **move_by** is being applied; the object in front of the DOT; the object referred to in the 2nd set of code as **p**. (Grader: Any of these, or just **p** is OK.)

   dy _ **2** **self.y** __ **50** (will be set to **52** by **move_by**)