Warm up discussion problem:

Your last good ping-pong ball fell down into a narrow metal pipe embedded in concrete one foot deep. The only tools you have at your disposal are your tennis paddle, your shoe-laces, bubble gum, and your plastic water bottle (which does not fit into the pipe.)
How can you get your ping-pong ball out, undamaged?

Workshop: *Functions*

1. Parameters are an important concept in defining functions.
   (a) What is the purpose of parameters?
   (b) What is the difference between a formal parameter and an actual parameter?
   (c) In what ways are parameters similar to and different from ordinary variables?

2. Identify the formal, actual parameters of the following function, and more specifically which of those are positional and keyword parameters. Then, give the result of each call to the function:

```
def do_math(x, y, z=5):
    result = (x + y)**z
    return result

print(do_math(3, 7))
print(do_math(8, 4, 3))
```

3. Functions can be thought of as miniature (sub)programs inside other programs. Like any other program, we can think of functions as having input and output to communicate with the main program.
   (a) How does a program provide "input" to one of its functions?
   (b) How does a function provide "output" to the program?
   (c) Discuss the differences and similarities between **`return`** and **`print`**`()`, both which pass information in programs.

4. Consider this very simple program:

```
def cube(x):
    answer = x * x * x
    return answer
```

```
def main():
    answer = 4
    result = cube(3)
    print(answer, result)

main()
```

The output of this program is `4 27`. Explain why the output is not `27 27`, even though the function cube seems to change the value of answer to `27`. Trace through this program and verify your answer.

5. Write the code for these functions:

```
def sphereArea(radius):
    # Returns the surface area of a sphere with radius
def sphereVolume(radius):
    # Returns the volume of a sphere with radius
```

Use these two functions to write a program that returns the area and the volume of a sphere given its radius as input.

6. Write a program that calculates the cost per square inch of a circular pizza, given its diameter and price. The formula for area is $A = \pi r^2$. Use two functions, one to compute the area of a pizza, and one to compute cost per square inch.

7. Can you rewrite the Numbers lab assignment (Newton's Method) to use a function named `nextGuess(guess, x)` that returns the next guess in solving for a square root value?