

Given the two functions below create the codes that will perform the following task:

$$f(x) = 4x$$

$$g(x) = 2x - 3$$

1.) Generate randomly 10 integers from 0 to 10. Place these in “Input” as the input holder.

Input: [8, 7, 10, 3, 9, 9, 6, 6, 0, 7]

2.) Use the inputs in no.1 to generate the output of $f(x)$, place it in “OutputF”. Use the same inputs for $g(x)$ and place it in “OutputG”.

OutputF: [32, 28, 40, 12, 36, 36, 24, 24, 0, 28]
OutputG: [13, 11, 17, 3, 15, 15, 9, 9, -3, 11]

3.) Find the output of the difference of $f(x) - g(x)$, and place it in “FsubtractionG”.

FsubtractionG: [19, 17, 23, 9, 21, 21, 15, 15, 3, 17]

4.) Find the output of the quotient of $f(x)$ and $g(x)$, and place it in “FquotientG”.

FdivisionG: [2.4615384615384617, 2.5454545454545454, 2.3529411764705883, 4.0, 2.4, 2.4, 2.6666666666666665, 2.6666666666666665, -0.0, 2.5454545454545454]

5.) Find the output of the composition of $(f \circ g)(x)$, and place it in “FcomposeG”.

FcomposeG: [52, 44, 68, 12, 60, 60, 36, 36, -12, 44]

Code:

```
prelim1.py X  prelim2.py
prelim1.py > ...
1  import random
2
3  # Define the functions
4  def f(x):
5      |   return 4 * x
6
7  def g(x):
8      |   return 2 * x - 3
9
10 # Step 1: Generate 10 random integers from 0 to 10
11 inputs = [random.randint(0, 10) for _ in range(10)]
12
13 # Step 2: Generate outputs for f(x) and g(x)
14 OutputF = [f(x) for x in inputs]
15 OutputG = [g(x) for x in inputs]
16
17 # Step 3: Find the output of the difference of f(x) - g(x)
18 FsubtractionG = [f(x) - g(x) for x in inputs]
19
20 # Step 4: Find the output of the quotient of f(x) / g(x)
21 FdivisionG = [f(x) / g(x) if g(x) != 0 else float('inf') for x in inputs]
22
23 # Step 5: Find the output of the composition of (f o g)(x)
24 FcomposeG = [f(g(x)) for x in inputs]
25
26 # Print the results
27 print("Input:", inputs)
28 print("OutputF:", OutputF)
29 print("OutputG:", OutputG)
30 print("FsubtractionG:", FsubtractionG)
31 print("FdivisionG:", FdivisionG)
32 print("FcomposeG:", FcomposeG)
```