

Math Homework – PreIB 3.AB 3 & 4

Functions & Linear Equations

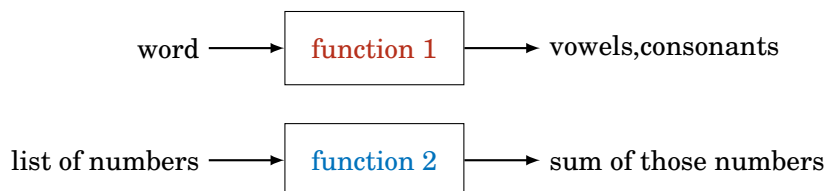
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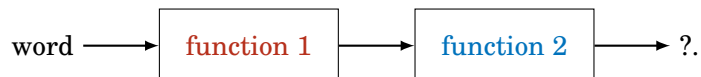
DON'T FORGET TO EXPLAIN STUFF AND INCLUDE COMPUTATIONS WHERE APPROPRIATE!

Functions & Function Composition

You're given two functions – a **function** which receives a word and outputs the number of *vowels* and *consonants* (as a list of two numbers) in that word and another **function** which receives a list of however many numbers and simply computes their sum. Meaning, if it receives a list a, b, c, d, e , it outputs $a + b + c + d + e$.



1. (10 %) In easy terms (you need like 4-5 words) describe the output of the composition



2. (15 %) Find and describe (using a diagram for example) **third function** such that the composition



outputs the number 0 whenever the given *word* has the same number of *vowels* and *consonants*.

3. (15 %) Given real functions $f(x) = (x-1)(x-2)$ and $g(x) = x+3$, compute $f+g$, $f \cdot g$, $f \circ g$ and $g \circ f$.
4. (10 %) Is it true that $(f \circ g)(0) = (g \circ f)(0)$?

Linear Equations

Consider the system

$$\begin{array}{rcrcrcrcl} 3x & + & y & = & 2, \\ -x & + & 2y & = & -3. \end{array}$$

1. (15 %) Interpret both equations as linear functions in your chosen variable and draw their graphs.
2. (10 %) Compute (**both coordinates of**) the intersection of the graphs from point 1.
3. (15 %) Find another linear function h whose graph intersects the graphs of f and g at the point calculated in 2. Draw it.
4. (10 %) Using only your *reasoning* (that is, no computation) deduce whether the system

$$\begin{array}{l} y = f(x), \\ y = h(x) \end{array}$$

has the same solution as the original system. Explain.