

1. [9 points] Ecologists are testing the water in a local wetland during three weeks of heavy rainfall in the late summer. They test for acidity (pH), temperature ( $T$ ), and dissolved oxygen content (DO), making one measurement per week at the same time and location each week.

To the right is a table of their measurements in week  $w$  of the water's pH, temperature  $T$  in degrees Celsius, and DO in milligrams per liter. Unfortunately, their pH measurement in week 2 was faulty and had to be discarded. Use the values in the table to answer the questions below.

$w$	1	2	3
pH	9	?	7
$T$	25	25	23
DO	6.5	7.5	8.5

- a. [1 point] Based on the given data, could  $T$  be a linear function of  $w$ , an exponential function of  $w$ , or neither? *Circle the one correct answer below.*

COULD BE LINEAR

COULD BE EXPONENTIAL

COULD NOT BE EITHER

- b. [1 point] Based on the given data, could DO be a linear function of  $w$ , an exponential function of  $w$ , or neither? *Circle the one correct answer below.*

COULD BE LINEAR

COULD BE EXPONENTIAL

COULD NOT BE EITHER

- c. [2 points] Assuming pH is a linear function of  $w$ , find a formula  $L(w)$  for it.

**Answer:**  $L(w) =$  \_\_\_\_\_

- d. [3 points] Assuming pH is an exponential function of  $w$ , find a formula  $E(w)$  for it.

**Answer:**  $E(w) =$  \_\_\_\_\_

- e. [2 points] Let  $L(w)$  be the linear function from part **c.**, and  $E(w)$  the exponential function from part **d.** above. **For each of the three pairs of values listed below, circle the value that is larger.**

$L(0)$  OR  $E(0)$

$L(2)$  OR  $E(2)$

$L(4)$  OR  $E(4)$