- 1. [8 points] Indicate if each of the following statements are true or false by circling the correct answer. No justification is required.
  - **a.** [2 points] For any function f, f(x+3) = f(x) + f(3).

True False

**b.** [2 points] The function k(w) shown in the table below could be linear.

True False

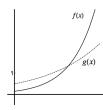
c. [2 points] Let the function g(x) be the inverse of h(x). If h(3) = 4, then h(g(4)) = 4.

True False

**d.** [2 points] According to the following table, Z could be a function of Y.

True False

- **2**. [6 points]
  - **a.** [4 points] Consider the exponential functions  $f(x) = ab^x$  and  $g(x) = cd^x$ , where a, b, c and d are positive constants. The graphs of f(x) (in solid line) and g(x) (in dashed line) are shown below.



Determine which of the following inequalities must be true. Circle all that apply.

Solution:

b < d

a < c c < a

|c < b|

b < c

**b.** [2 points] Find the value of the constant m if the lines 2x + 4y = 5 and mx - 3y = 1 are perpendicular.

Solution: The slope of the first line is  $m_1 = -0.5$  and the second line  $m_2 = \frac{m}{3}$ . The lines are perpendicular if  $m_1m_2 = -1$ . Then m = 6.