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.

w	2	4	7
$k(w)$	-2	1	4

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

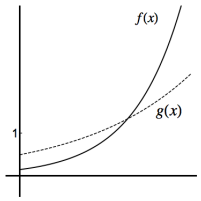
d. [2 points] According to the following table, Z could be a function of Y.

Y	2	3	3.7	4.5	5.2
Z	-2	1.5	3.4	2.6	1.5

[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:

$b < d$ [$d < b$] [$a < c$] $c < a$ [$c < b$] $b < c$

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 $m_2 = \dfrac{m}{3}$. The lines are perpendicular if $m_1 m_2 = -1$. Then $m = 6$.