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.
      \[
      \begin{array}{c|c|c|c}
        w & 2 & 4 & 7 \\
        \hline
        k(w) & -2 & 1 & 4 \\
      \end{array}
      \]
      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 $Y$.
      \[
      \begin{array}{c|c|c|c|c|c}
        Y & 2 & 3 & 3.7 & 4.5 & 5.2 \\
        \hline
        Z & -2 & 1.5 & 3.4 & 2.6 & 1.5 \\
      \end{array}
      \]
      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.

   \[ 
   \text{Graphs of } f(x) 	ext{ and } g(x).
   \]

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

   \[
   \begin{align*}
   b < d & \quad d < b \\ 
   a < c & \quad c < a \\ 
   c < b & \quad b < c
   \end{align*}
   \]

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

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