More Function Problems

Exercises:

1. A first grade teacher has 30 children in her class. She lines them up so they are in alphabetical order by their last name. The first child on line is Maria Alvarez and the last child on line is Jack Smith. Let f be the function that assigns to each student in the class the first letter of their first name. Let g be the function that assigns to each student in the class the first letter of their last name.

   Answer the following questions in complete sentences. Fully explain your answers. If an answer cannot be obtained based on the information provided, indicate that fact and explain why the question cannot be answered.

   a) g(Maria Alvarez)=

   b) f(Jack Smith) $=$

   c) Is there a student x such that $g(x) = T$?

   d) Do there exist two different students x and y such that $g(x) = g(y)$?

   e) If x is a student and $g(x) = A$ and $f(x) = B$, then what are the initials of student x?

   f) If x and y are students and $f(x) = C$ and $f(y) = D$, then is who is ahead on line, x or y?

g) If x and y are students and $g(x) = C$ and $g(y) = D$, then who is ahead on line, x or y?

2. Let A and B denote the set of all numbers. Let f be that function that, to each element of A, assigns -3 times the element. Answer the following:

a) $f(4) =$

b) $f(6) =$

c) $f(1/3) =$

d) $f(-2) =$

e) $f(-6) =$

f) $f(\sqrt{2}) =$

g) If x is any number, determine what $f(x)$ is.

h) Is there a number c such that $f(c) = -24$? If so, find c. Can there be more than one value of c such that $f(c) = -24$?

i) Is there a number b such that $f(b)$ is negative? If so, find all numbers b such that $f(b) < 0$.

j)   If t is a number, find $f(t+1)$ and $f(-t)$.

k)   If t is a number determine $f(t+3)$ and $f(t)$.

l)   Is there a number c such that $f(c) > 100$? If so, find all such numbers c.

3. Let A and B be the set of all numbers. Let f be the function that, to each element x in A, assigns $3x^2 + 5$. Another way of writing this function is as $f(x) = 3x^2 + 5$. Determine the following:

a) $f(-1) =$ 　　　　　　　b) $f(0) =$ 　　　　　　　c) $f(1/2) =$

d) $f(-2) =$ 　　　　　　　e) $f(-3) =$ 　　　　　　　f) $f(\sqrt{2}) =$

g)   If t is any number, determine what $f(t)$ is.

h)   Is there a number c such that $f(c) = 53$? If so, find c. Can there be more than one value of c such that $f(c) = 53$?

3

i) Is there a number b such that $f(b)$ is negative? If so, find all numbers b such that $f(b) < 0$.

j) If t is a number, find $f(t+1)$ and $f(t-1)$.

k) Find two numbers r and s, with r smaller than s, but $f(r) > f(s)$.

l) Is there a number M such that, no matter what number c is, $f(c) > M$? If so, find all such numbers M.