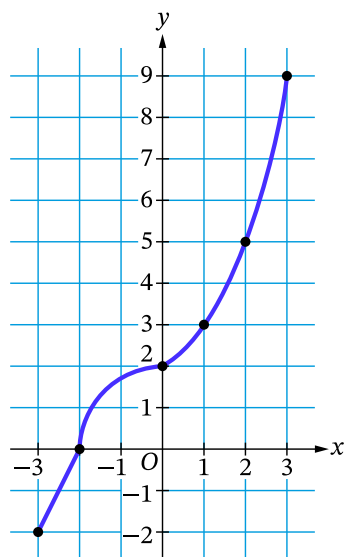


1. The figure shows the graph of the increasing function f on its domain of $-3 \leq x \leq 3$.

Graph of f

The function g is given by $g(x) = -4.792 + \ln(6x - 6)$.

A.

- The function h is defined by $h(x) = (g \circ f)(x) = g(f(x))$. Find the value of $h(2)$ as a decimal approximation, or indicate that it is not defined. Show the work that leads to your answer.
- Find all values of x for which $f(x) = 3$, or indicate that there are no such values.

B.

- Find all values of x , as decimal approximations, for which $g(x) = -1.5$, or indicate that there are no such values.
- Determine the behavior of g as x -values decrease and get arbitrarily close to 1. Express your answer using the mathematical notation of a limit.

C.

- Is the function f invertible?
- Give a reason for your answer in part C (i) based on properties of the function f . Refer to points on the graph of f in your reasoning.

1. The function f is decreasing and is defined for all real numbers. The table gives values for $f(x)$ at selected values of x .

x	-2	-1	0	1	2
$f(x)$	14	7	3.5	1.75	0.875

The function g is given by $g(x) = -0.167x^3 + x^2 - 1.834$.

A.

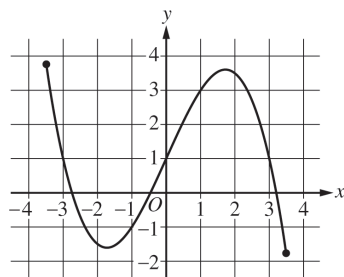
- The function h is defined by $h(x) = (g \circ f)(x) = g(f(x))$. Find the value of $h(1)$ as a decimal approximation, or indicate that it is not defined. Show the work that leads to your answer.
- Find the value of $f^{-1}(3.5)$, or indicate that it is not defined.

B.

- Find all values of x , as decimal approximations, for which $g(x) = 0$, or indicate that there are no such values.
- Determine the end behavior of g as x increases without bound. Express your answer using the mathematical notation of a limit.

C.

- Based on the table, which of the following function types best models function f : linear, quadratic, exponential, or logarithmic?
- Give a reason for your answer in part C (i) based on the relationship between the change in the output values of f and the change in the input values of f . Refer to the values in the table in your reasoning.

Graph of f

1. The figure shows the graph of the function f on its domain of $-3.5 \leq x \leq 3.5$. The points $(-3, 1)$, $(0, 1)$, and $(3, 1)$ are on the graph of f . The function g is given by $g(x) = 2.916 \cdot (0.7)^x$.
- (A) (i) The function h is defined by $h(x) = (g \circ f)(x) = g(f(x))$. Find the value of $h(3)$ as a decimal approximation, or indicate that it is not defined.
- (ii) Find all values of x for which $f(x) = 1$, or indicate that there are no such values.
- (B) (i) Find all values of x , as decimal approximations, for which $g(x) = 2$, or indicate that there are no such values.
- (ii) Determine the end behavior of g as x increases without bound. Express your answer using the mathematical notation of a limit.
- (C) (i) Determine if f has an inverse function.
- (ii) Give a reason for your answer based on the definition of a function and the graph of $y = f(x)$.

Write your responses to this question only on the designated pages in the separate Free Response booklet. Write your solution to each part in the space provided for that part.