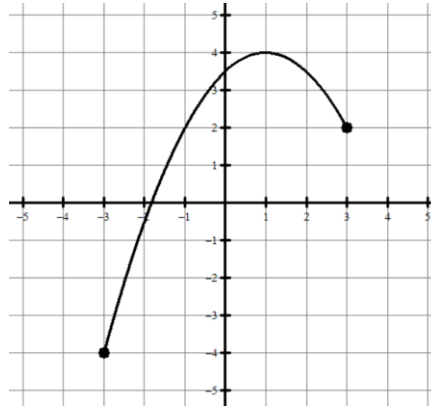


1.



graph of f

The figure shows the graph of the function f on its domain of $-3 \leq x \leq 3$. The function g is given by $g(x) = -0.25e^{x-1}$.

A.

- i. 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.
- ii. Find all values of x for which $f(x) = 2$, or indicate there are no such values.

B.

- i. Find all values of x , as decimal approximations, for which $g(x) = -4$, or indicate 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 $y = f(x)$.

Answers to FRQ #1 – GRAPH CA #2

Model Solution	Scoring
A i. $h(1) = g(f(1))$ $h(1) = g(4) = -5.021$ <hr/> ii. from the graph, $f(x) = 2$ when $x = -1$ and $x = 3$	Work and Answer 1 point
	Answers 1 point
B i. $g(x) = 4 \Rightarrow -0.25e^{x-1} = -4$ $x = 3.772$ or 3.773 <hr/> ii. $\lim_{x \rightarrow \infty} g(x) = -\infty$	Answer 1 point
	Answer with correct notation 1 point
C i. f does not have an inverse function on its domain $-3 \leq x \leq 3$. <hr/> ii. There are output values of f that are not mapped from unique input values; for example, $f(-1) = f(3) = 2$	Answer 1 point
	Reasoning 1 point