

Past-paper walk-through

Logarithmic Functions ■ 2.11

eXercise

Questions in this set

- 2026 Q1

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

Question 1

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The figure shows the graph of the increasing function f on its domain of $-3 \leq x \leq 3$. [Graph of f : a smooth increasing S-shaped curve on a coordinate grid, x -axis from -3 to 3 , y -axis from -2 to 9 (gridlines at every integer). Labeled points on the curve: $(-3, -2)$, $(-1, 1)$, $(0, 1.8)$, $(1, 3)$, $(2, 5)$, $(3, 9)$. The curve rises slowly near the middle (around $x = 0$) and rises steeply toward both ends.]

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

(a)(i) 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.

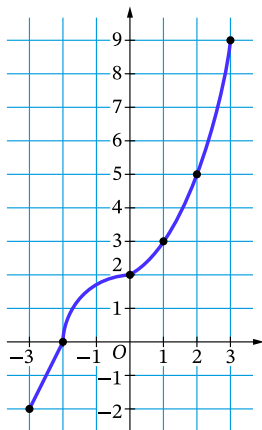
(a)(ii) Find all values of x for which $f(x) = 3$, or indicate that there are no such values.

(b)(i) Find all values of x , as decimal approximations, for which $g(x) = -1.5$, or indicate that there are no such values.

Question 1

- (b)(ii)** 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)(i)** Is the function f invertible?
- (c)(ii)** 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.

Question 1



Graph of f