

f r q

x	1	2	3	4	5
$f(x)$	-10	-5	4	17	34

Let f be an increasing function defined for $x \geq 0$. The table gives values of $f(x)$ at selected values of x . The function g is given by $g(x) = \frac{x^3 - 14x - 27}{x + 2}$.

4. Part A

- (i) The function h is defined by $h(x) = (g \circ f)(x) = g(f(x))$. Find the value of $h(5)$ as a decimal approximation, or indicate that it is not defined.
- (ii) Find the value of $f^{-1}(4)$, or indicate that it is not defined.

Part A

Select a point value to view scoring criteria, solutions, and/or examples to score the response.



0

1

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The student response includes both of these criteria.

- Value of $h(5)$
- Value of $f^{-1}(4)$

Model Solution

(i) $h(5) = g(f(5)) = g(34) = \frac{(34)^3 - 14(34) - 27}{34 + 2} = 1077.806$

(ii) Because f is increasing on its domain, f^{-1} exists. From the table, $f^{-1}(4) = 3$.

5. Part B

- (i) Find all values of x , as decimal approximations, for which $g(x) = 3$, or indicate there are no such values.
- (ii) Determine the end behavior of g as x decreases without bound. Express your answer using the mathematical notation of a limit.

Part B