

f r q

(ii) From the table,  $f^{-1}(20) = 16$ .

**Part B**

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



0	1	2
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The student response includes both of these criteria.

- Answer of  $x = 5.321$ ,  $x = 15.410$  (OR 15.409), and  $x = 17.269$
- End behavior with limit notation

**Model Solution**

(i)  $g(x) = -45 \Rightarrow 0.25x^3 - 9.5x^2 + 110x - 399 = -45$

$x = 5.321$ ,  $x = 15.410$  (OR 15.409), and  $x = 17.269$

(ii) As  $x$  increases without bound, the output values of  $g$  increase without bound. Therefore,  $\lim_{x \rightarrow \infty} g(x) = \infty$ .

**Part C**

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



0	1	2
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The student response includes both of these criteria.

- Answer of logarithmic function
- Reason for logarithmic function (Note: reference to a logarithmic regression is not a sufficient reason.)

**Model Solution**

(i)  $f$  is best modeled by a logarithmic function.

(ii) The input values change proportionately as output values increase in equal-length intervals. In this case, output values of intervals of 5 correspond to input values with a growth factor of 2.

A reason that references “logarithmic regression” is not sufficient.