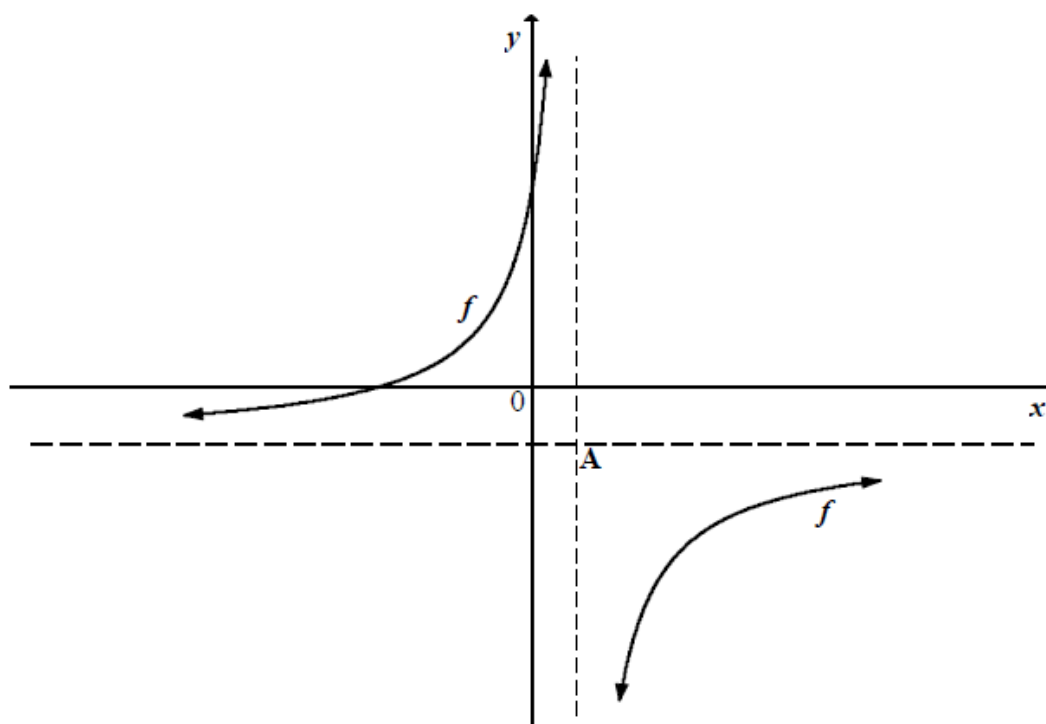


## QUESTION 5

5.1 The sketch below shows the graph of  $f(x) = \frac{-9}{x-1} - 2$ .

A is the point of intersection of the asymptotes of  $f$ .



- 5.1.1 Write down the coordinates of A. (2)
- 5.1.2 Determine the coordinates of the  $x$ - and  $y$ -intercepts of  $f$ . (5)
- 5.1.3 Write down an equation of the axis of symmetry of  $f$  that has a negative gradient. (2)
- 5.1.4 Hence, or otherwise, determine the coordinates of a point that lies on  $f$  in the fourth quadrant, which is the closest to point A. (5)
- 5.1.5 The graph of  $f$  is reflected about the  $x$ -axis to obtain the graph of  $g$ . Write down the equation of  $g$  in the form  $y = \dots$  (2)
- 5.2 Given:  $h(x) = 4(2^{-x}) + 1$
- 5.2.1 Determine the coordinates of the  $y$ -intercept of  $h$ . (2)
- 5.2.2 Explain why  $h$  does not have an  $x$ -intercept. (2)
- 5.2.3 Draw a sketch graph of  $h$ , clearly showing all asymptotes, intercepts with the axes and at least one other point on  $h$ . (3)
- 5.2.4 Describe the transformation from  $h$  to  $g$  if  $g(x) = 4(2^{-x} + 2)$ . (2)