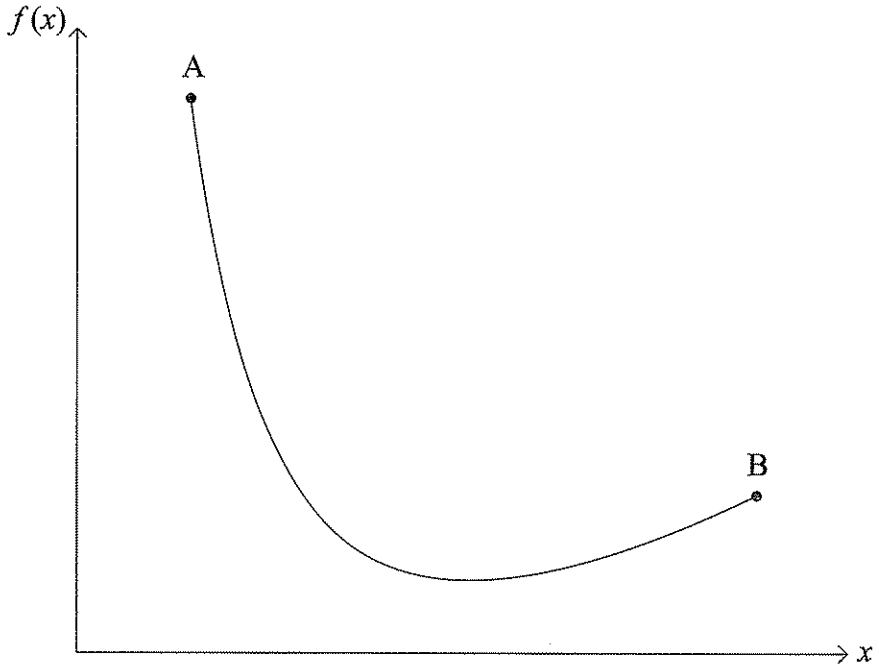
4. *[Maximum mark: 21]*

The graph of the function $f(x) = \frac{14}{x} + x - 6$, for $1 \leq x \leq 7$ is given below.



(a) Calculate $f(1)$. *[2 marks]*

(b) Find $f'(x)$. *[3 marks]*

(c) **Use your answer to part (b)** to show that the x-coordinate of the local minimum point of the graph of f is 3.7 correct to 2 significant figures. *[3 marks]*

(d) Find the range of f. *[3 marks]*

Points A and B lie on the graph of f. The x-coordinates of A and B are 1 and 7 respectively.

(e) Write down the y-coordinate of B. *[1 mark]*

(f) Find the gradient of the straight line passing through A and B. *[2 marks]*

M is the midpoint of the line segment AB.

(g) Write down the coordinates of M. *[2 marks]*

(This question continues on the following page)

(Question 4 continued)

L is the tangent to the graph of the function $y = f(x)$, at the point on the graph with the same x-coordinate as M.

(h) Find the gradient of L. *[2 marks]*

(i) Find the equation of L. Give your answer in the form $y = mx + c$. *[3 marks]*