1. The diagram below shows the graph of the function $y = f(x)$, defined for all $x \in \mathbb{R}$, where $b > a > 0$.
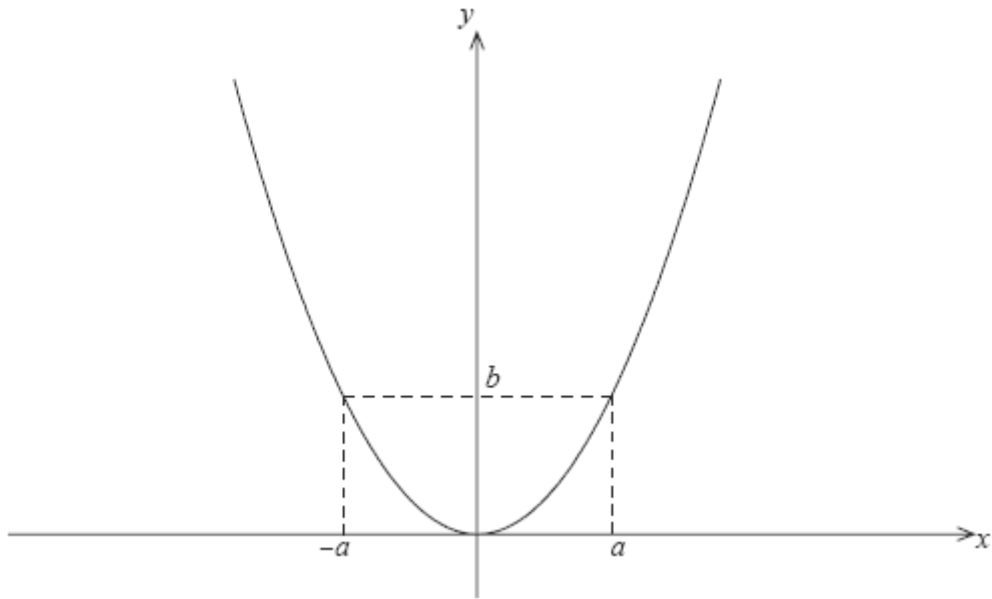
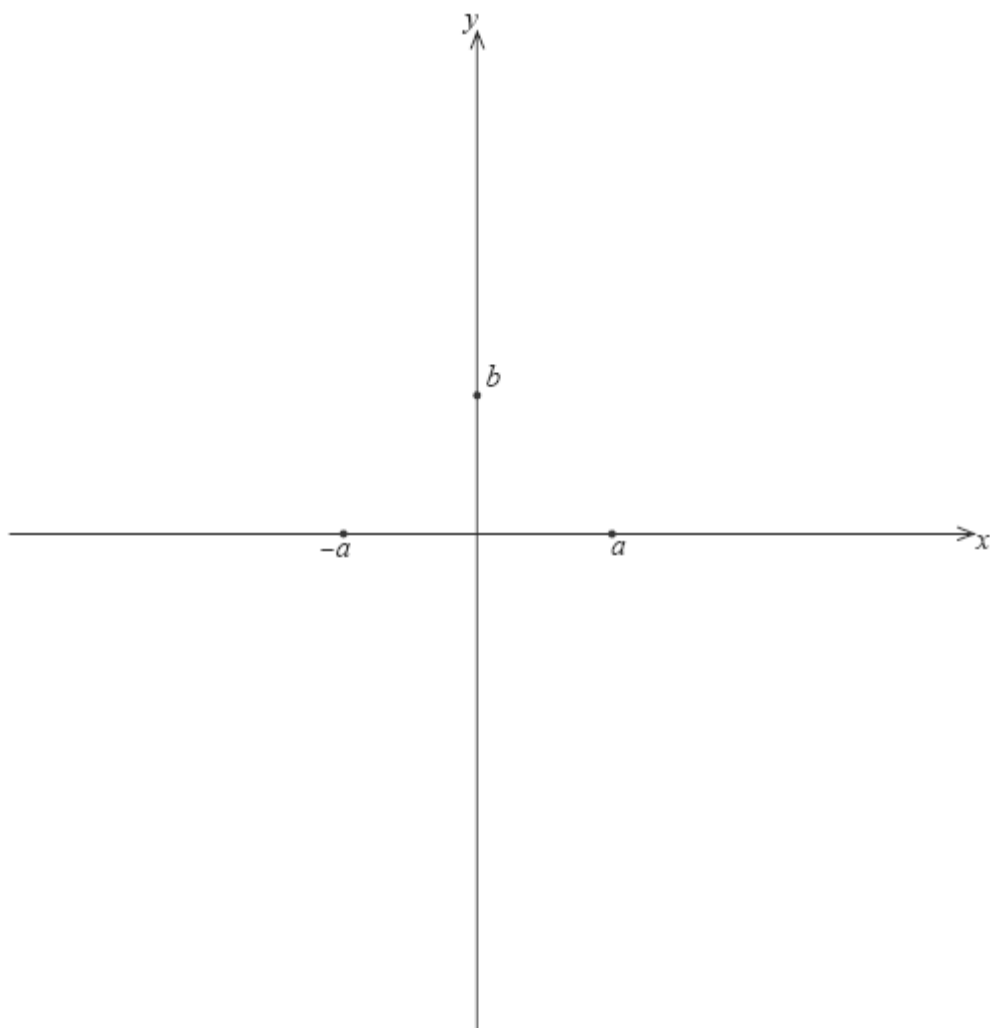

Consider the function $g(x) = \dfrac{1}{f(x-a)-b}$.

(a) Find the largest possible domain of the function g.
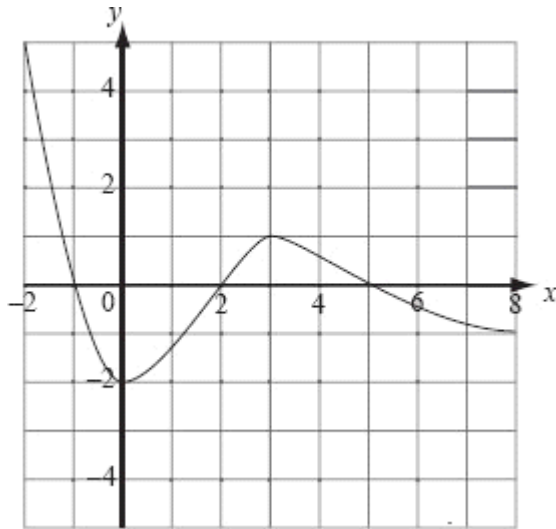
(2)

(b)   On the axes below, sketch the graph of $y = g(x)$. On the graph, indicate any asymptotes and local maxima or minima, and write down their equations and coordinates.
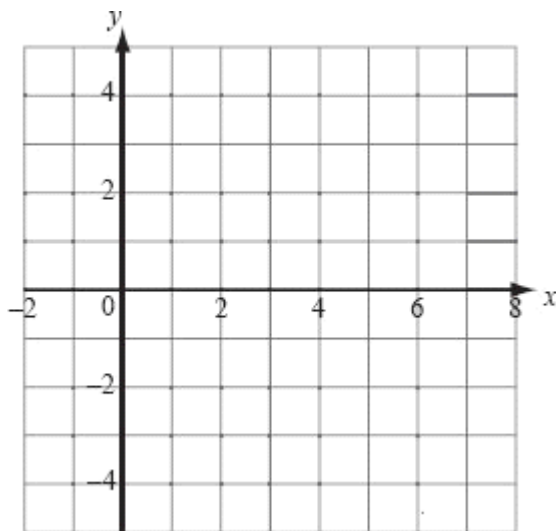

(6)
(Total 8 marks)

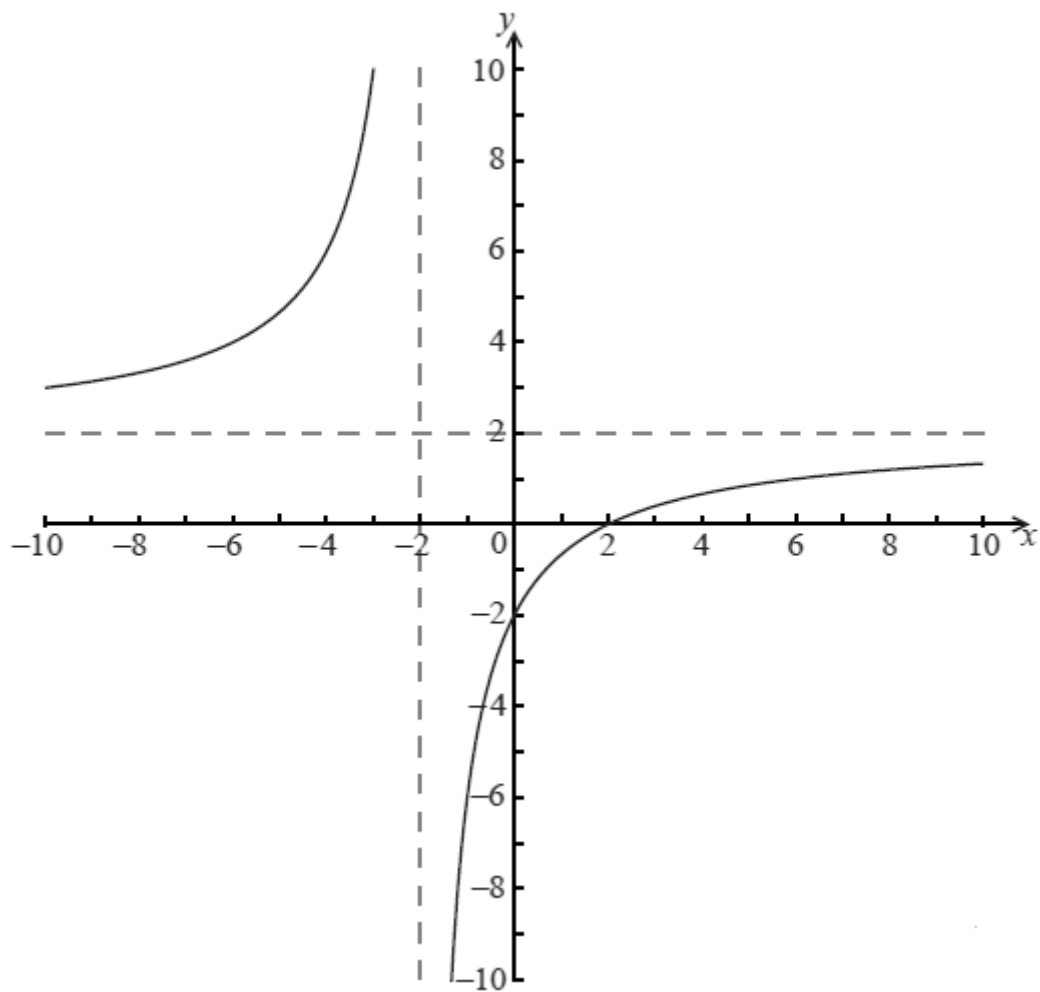**2.** The graph of $y = f(x)$ for $-2 \le x \le 8$ is shown.

On the set of axes provided, sketch the graph of $y = \dfrac{1}{f(x)}$, clearly showing any asymptotes and indicating the coordinates of any local maxima or minima.
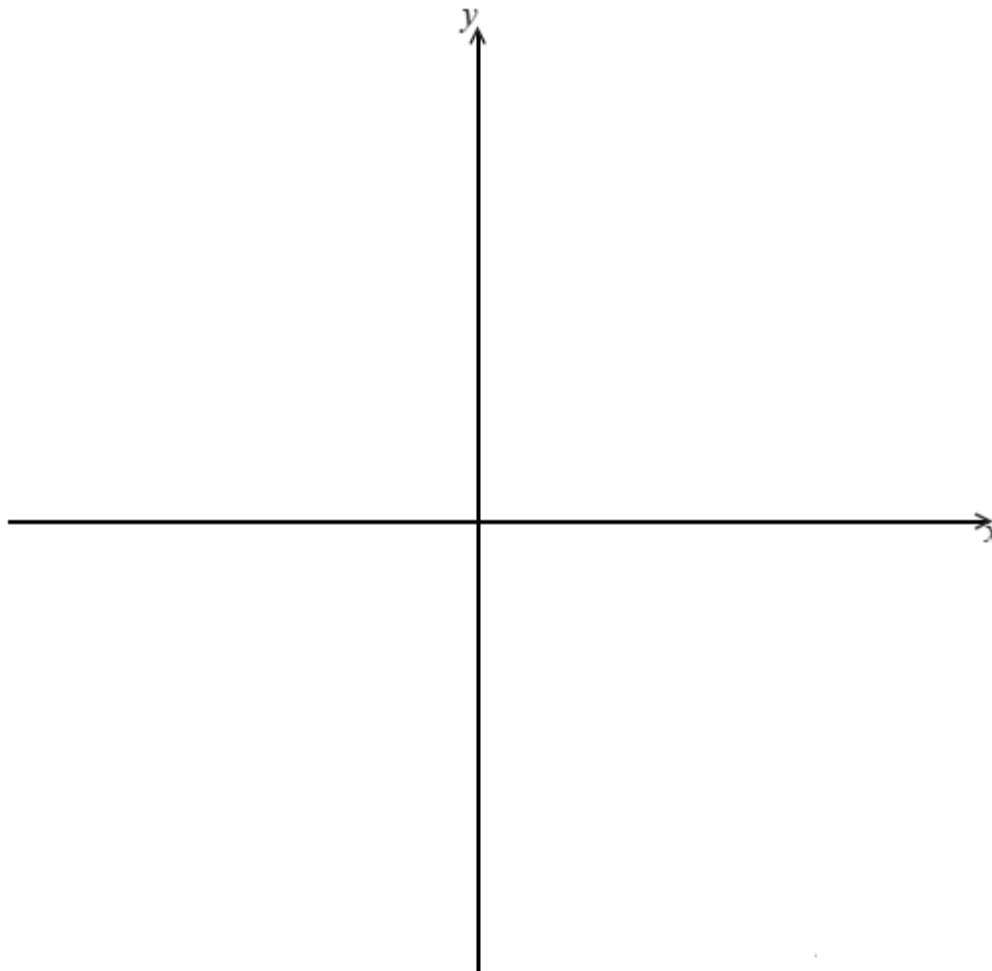

(Total 5 marks)

3. The graph of $y = \dfrac{a+x}{b+cx}$ is drawn below.

(a) Find the value of a, the value of b and the value of c.
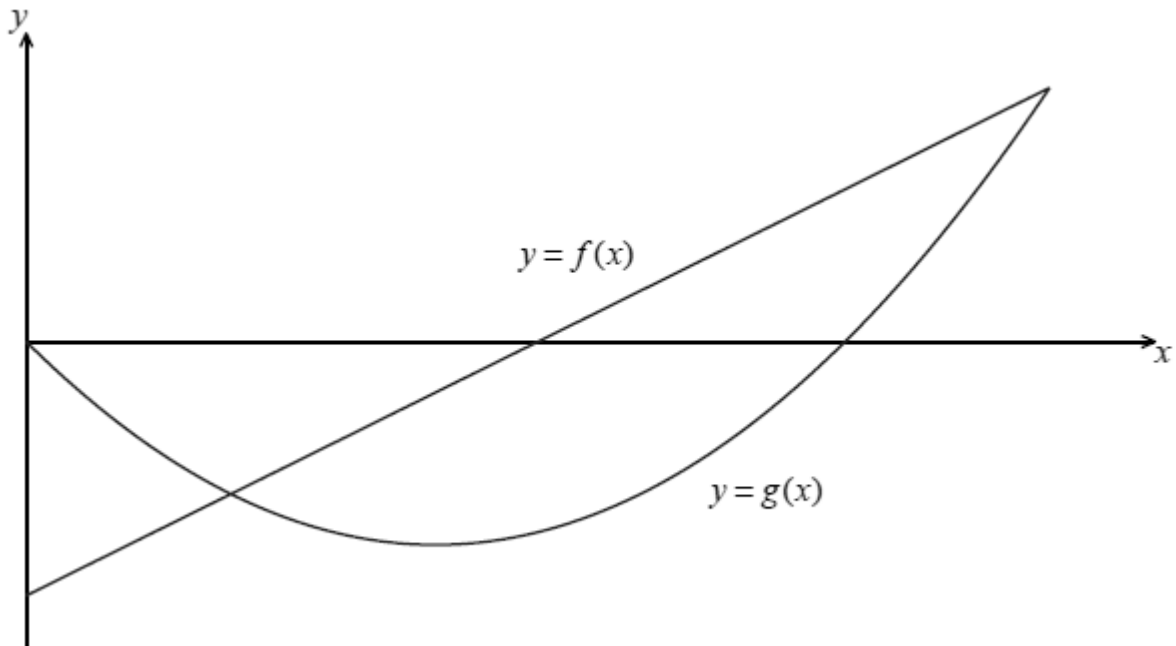
(4)

(b)   Using the values of a, b and c found in part (a), sketch the graph of $y = \left| \dfrac{b+cx}{a+x} \right|$ on the axes below, showing clearly all intercepts and asymptotes.

(4)
(Total 8 marks)

4. The diagram shows the graphs of a linear function f and a quadratic function g.

On the same axes sketch the graph of $\dfrac{f}{g}$. Indicate clearly where the x-intercept and the asymptotes occur.

(Total 5 marks)