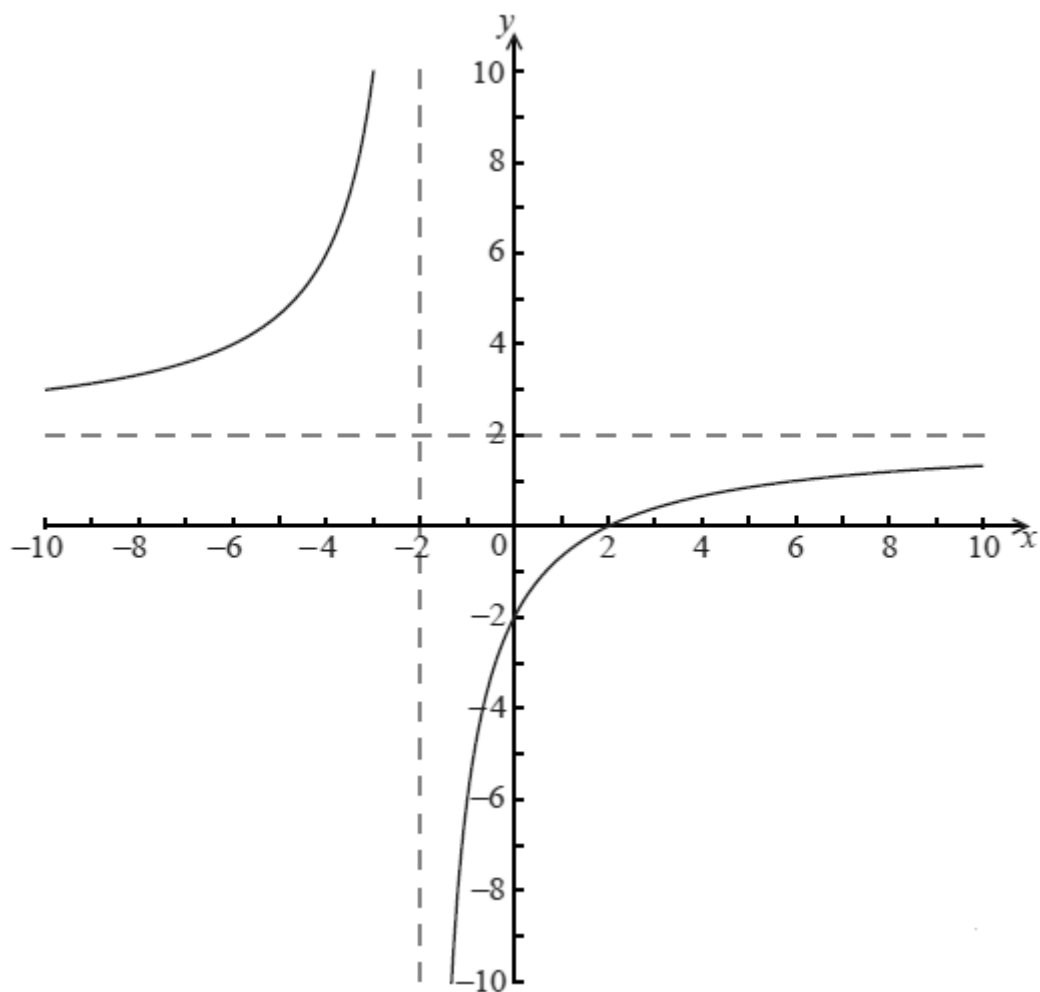


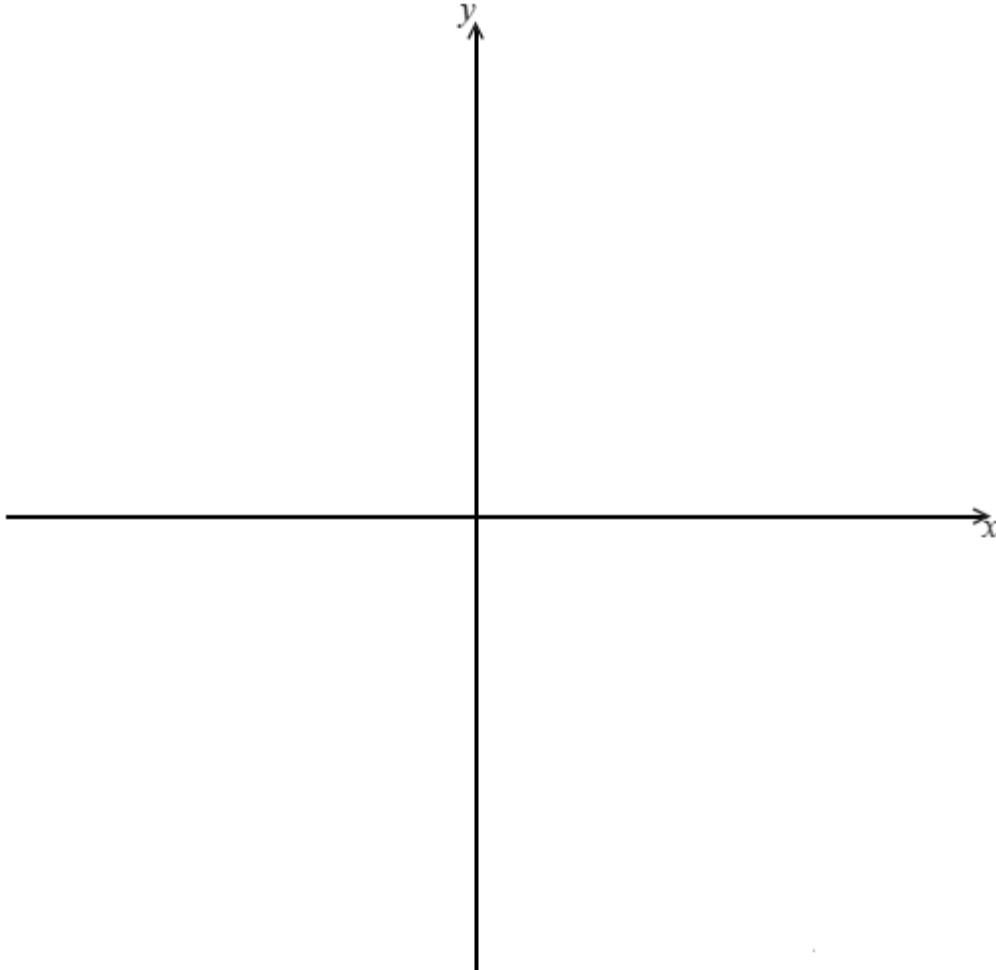
1. The graph of $y = \frac{a+x}{b+cx}$ is drawn below.



- (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 $y = \left| \frac{b+cx}{a+x} \right|$ on the axes below, showing clearly all intercepts and asymptotes.



(4)
(Total 8 marks)

2. Consider the function g , where $g(x) = \frac{3x}{5+x^2}$.

- (a) Given that the domain of g is $x \geq a$, find the least value of a such that g has an inverse function.

(1)

(b) On the same set of axes, sketch

(i) the graph of g for this value of a ;

(ii) the corresponding inverse, g^{-1} .

(4)

(c) Find an expression for $g^{-1}(x)$.

(3)

(Total 8 marks)

3. Let $f(x) = \frac{4}{x+2}$, $x \neq -2$ and $g(x) = x - 1$.

If $h = g \circ f$, find

(a) $h(x)$;

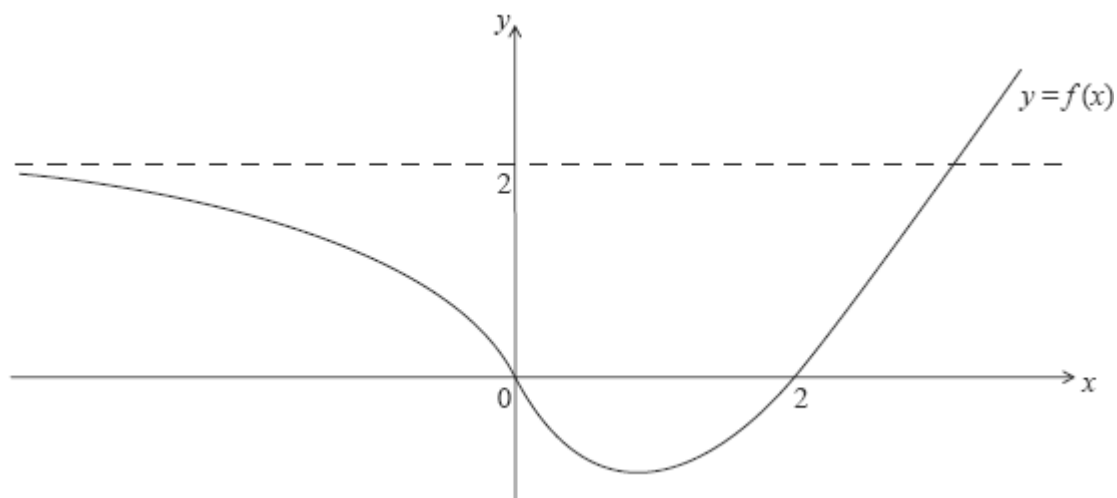
(2)

(b) $h^{-1}(x)$, where h^{-1} is the inverse of h .

(4)

(Total 6 marks)

4. The diagram shows the graph of $y = f(x)$. The graph has a horizontal asymptote at $y = 2$.



(a) Sketch the graph of $y = \frac{1}{f(x)}$.

(3)

(b) Sketch the graph of $y = xf(x)$.

(3)

(Total 6 marks)