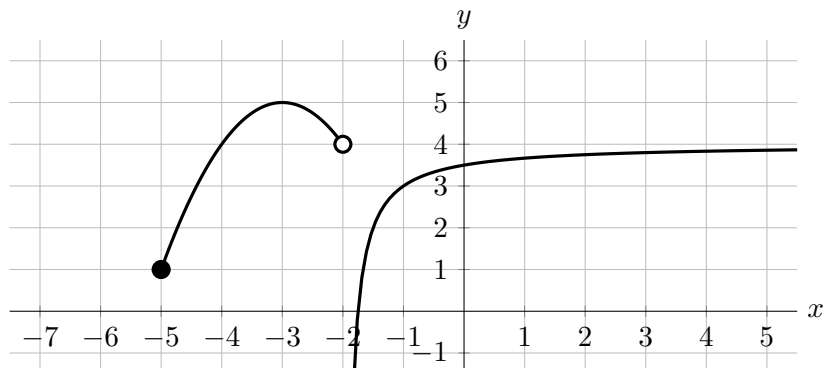


3. [14 points] Consider the function  $f(x)$ , graphed below. Note that  $f(x)$  has one vertical asymptote and one horizontal asymptote, and  $f(x)$  is not defined for  $x$  values to the left of those shown in the graph.



- a. [7 points] Find:
- the domain of  $f(x)$
  - the range of  $f(x)$
  - an equation for the horizontal asymptote of  $f(x)$
  - an equation for the vertical asymptote of  $f(x)$
- b. [7 points] Let  $g(x) = 3f(-4(x - 2)) + 1$ . Find the following. Show how you obtained your answers, either by showing work, drawing diagrams, or explaining your reasoning.
- the domain of  $g(x)$
  - an equation for the horizontal asymptote of  $g(x)$
  - an equation for the vertical asymptote of  $g(x)$
4. [11 points] Mia and Jonathan sell vegetables at the farmer's market at different booths. Their revenues, in **hundreds** of dollars,  $h$  hours after 9 am on a particular day are  $M(h)$  (for Mia's revenue) and  $J(h)$  (for Jonathan's revenue). Assume that the two functions are invertible.
- [2 points] Give a practical interpretation of the equation  $J(2) = 3$ .
  - [3 points] Give a practical interpretation of the expression  $J(M^{-1}(4))$ , or explain why the expression does not make sense in the context of the problem.
  - [3 points] Write an equation corresponding to the following statement: Mia's revenue at 12pm is \$100 less than twice Jonathan's revenue at 11 am.
  - [3 points] Let  $T(k)$  be the total revenue, in **dollars** of both Mia and Jonathan  $k$  **minutes** after 9 am. Find a formula for  $T(k)$  in terms of  $M$  and/or  $J$ .