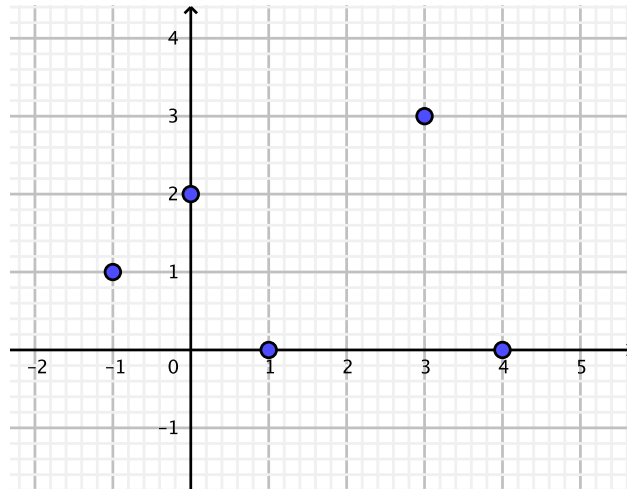


### 1-3 Homework: Function substitution

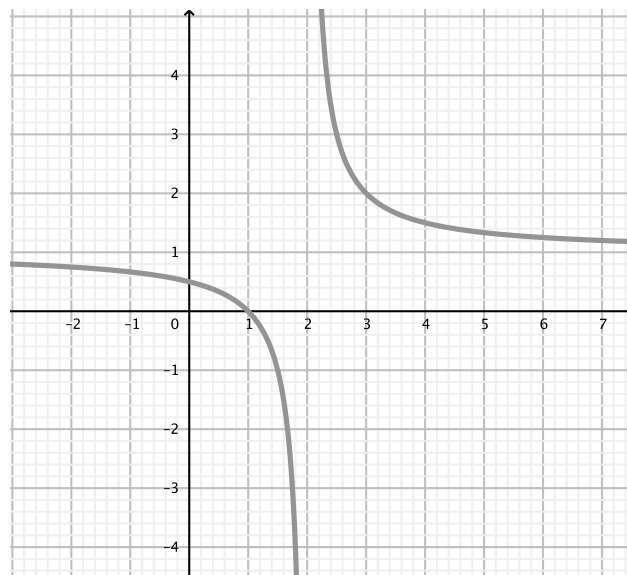
Answer on loose leaf paper in pen, or, for the graphs, on graph paper in pencil. Show working for all problems.

1. For the function  $f(x) = 2x - 7$ 
  - (a) What is the value of  $f(3)$ ?
  - (b) Solve for  $x$  if  $f(x) = 0$ .
  - (c) Find  $f(1 - x)$ .
  - (d) Solve for  $x$  if  $f(x) = x$ .
2. For the function  $g(x) = x^2 - 4$  with  $x > 0$ 
  - (a) Simplify the expression  $g(x - 3)$
  - (b) Solve  $g(x) = 0$ .
  - (c) Write down the domain and range of the function  $g$ .
3. For the functions  $f(x) = 2 - x^2$  and  $g(x) = 2x + 3$ 
  - (a) What is the value of  $g(3)$ ?
  - (b) Solve  $f(x) = g(x)$ .
4. Given that  $g(x) = \frac{1}{3}x + 3$ 
  - (a) Find  $g(\frac{9}{2})$ .
  - (b) At what point does the graph of  $g(x)$  cross the  $y$ -axis?
5. For the functions defined by  $f(x) = 2x$  and  $g(x) = x + 4$ 
  - (a) Find an expression for  $(f + g)(x) = f(x) + g(x)$ .
  - (b) Find  $(f + g)(-4)$ .
6. Write down the domain and range of  $f(x) = x^2 - 6$ . Use set notation (i.e. brackets)
7. Using a GDC to analyze the function  $f(x) = \frac{3x + 2}{x + 1}$ 
  - (a) Write down the equations for the asymptotes.
  - (b) Write down the domain and range of  $f(x)$ .

8. Write down the domain and range of the function graphed using set notation.



9. For the function shown



- (a) Write down the equations for the asymptotes.  
(b) Write down the domain and range of the function. Assume that the curves extend indefinitely horizontally and vertically.
10. Consider the function  $f(x) = x^3 - 4x^2 - 3x + 18$ .

- (a) Find the values of  $f(x)$  for  $a$  and  $b$  in the table below:

$x$	-3	-2	-1	0	1	2	3	4	5
$f(x)$	-36	$a$	16	$b$	12	4	0	6	28