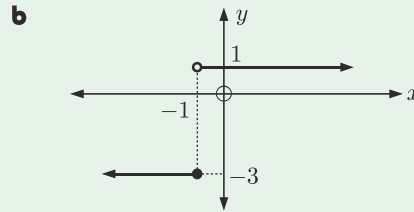
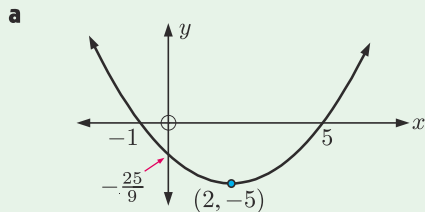


4 If  $g(x) = x^2 - 3x$ , find in simplest form: **a**  $g(x+1)$  **b**  $g(x^2 - 2)$

5 For each of the following graphs determine:

- i** the domain and range  
**ii** the  $x$  and  $y$ -intercepts  
**iii** whether it is a function.



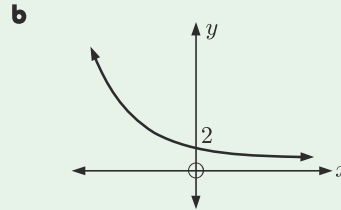
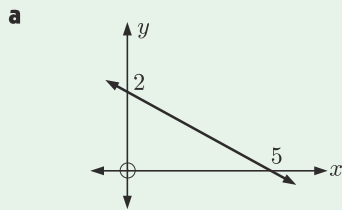
6 Draw a sign diagram for:

**a**  $(3x+2)(4-x)$

**b**  $\frac{x-3}{x^2+4x+4}$

7 If  $f(x) = ax + b$ ,  $f(2) = 1$ , and  $f^{-1}(3) = 4$ , find  $a$  and  $b$ .

8 Copy the following graphs and draw the inverse function on the same set of axes:



9 Find  $f^{-1}(x)$  given that  $f(x)$  is: **a**  $4x+2$  **b**  $\frac{3-5x}{4}$

10 Consider  $f(x) = x^2$  and  $g(x) = 1 - 6x$ .

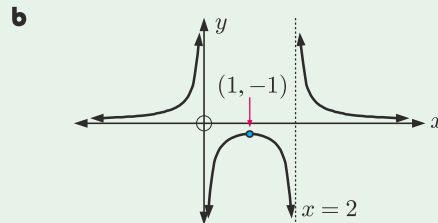
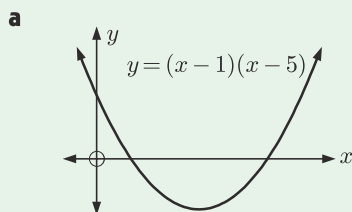
- a** Show that  $f(-3) = g(-\frac{4}{3})$ . **b** Find  $(f \circ g)(-2)$ .  
**c** Find  $x$  such that  $g(x) = f(5)$ .

11 Given  $f: x \mapsto 3x+6$  and  $h: x \mapsto \frac{x}{3}$ , show that  $(f^{-1} \circ h^{-1})(x) = (h \circ f)^{-1}(x)$ .

## REVIEW SET 2B

## CALCULATOR

1 For each of the following graphs, find the domain and range:



2 If  $f(x) = 2x - 3$  and  $g(x) = x^2 + 2$ , find in simplest form:

**a**  $(f \circ g)(x)$

**b**  $(g \circ f)(x)$

3 Draw a sign diagram for:

a  $\frac{x^2 - 6x - 16}{x - 3}$

b  $\frac{x + 9}{x + 5} + x$

4 Consider  $f(x) = \frac{1}{x^2}$ .

- a For what value of  $x$  is  $f(x)$  undefined, or not a real number?
- b Sketch the graph of this function using technology.
- c State the domain and range of the function.

5 Consider the function  $f(x) = \frac{ax + 3}{x - b}$ .

- a Find  $a$  and  $b$  given that  $y = f(x)$  has asymptotes with equations  $x = -1$  and  $y = 2$ .
- b Write down the domain and range of  $f^{-1}(x)$ .

6 Consider the function  $f : x \mapsto \frac{4x + 1}{2 - x}$ .

- a Determine the equations of the asymptotes.
- b State the domain and range of the function.
- c Discuss the behaviour of the function as it approaches its asymptotes.
- d Determine the axes intercepts.
- e Sketch the function.

7 Consider the functions  $f(x) = 3x + 1$  and  $g(x) = \frac{2}{x}$ .

- a Find  $(g \circ f)(x)$ .
- b Given  $(g \circ f)(x) = -4$ , solve for  $x$ .
- c Let  $h(x) = (g \circ f)(x)$ ,  $x \neq -\frac{1}{3}$ .
  - i Write down the equations of the asymptotes of  $h(x)$ .
  - ii Sketch the graph of  $h(x)$  for  $-3 \leq x \leq 2$ .
  - iii State the range of  $h(x)$  for the domain  $-3 \leq x \leq 2$ .

8 Consider  $f : x \mapsto 2x - 7$ .

- a On the same set of axes graph  $y = x$ ,  $y = f(x)$ , and  $y = f^{-1}(x)$ .
- b Find  $f^{-1}(x)$  using variable interchange.
- c Show that  $(f \circ f^{-1})(x) = (f^{-1} \circ f)(x) = x$ , the identity function.

9 The graph of the function  $f(x) = -3x^2$ ,  $0 \leq x \leq 2$  is shown alongside.

- a Sketch the graph of  $y = f^{-1}(x)$ .
- b State the range of  $f^{-1}$ .
- c Solve:
  - i  $f(x) = -10$
  - ii  $f^{-1}(x) = 1$

