Cambridge Senior Mathematics for the Australian Curriculum/VCE
Chapter 5 Functions and relations: **Assignment**

1 For the function with rule $g(x) = 2 - x^2$ find:

    a $g(2)$ **b** $g(-1)$

    c $g(a)$ **d** $g(a + 2)$

2 For the function with rule $f(x) = (x + 2)^2$ find:

    a $f(2)$ **b** $f(-1)$

    c $f(a)$ **d** $f(a + 2)$

3   **a** For $g: R \to R$, $g(x) = 4x - 3$, sketch the graph and state the range.

    b For $g: [-2, 3] \to R$, $g(x) = 4x - 3$, sketch the graph and state the range.

    c For $g: [-2, 3) \to R$, state the range.

    d For $g: (-2, 3) \to R$, state the range.

4   **a** For $g: R \setminus \{0\} \to R$, $g(x) = \dfrac{2}{x} + 3$, sketch the graph and state the range.

    b For $g: [1, 5] \to R$, $g(x) = \dfrac{2}{x} + 3$, sketch the graph and state the range.

    c For $g: [1, 5) \to R$ state the range.

    d For $g: (1, 5) \to R$ state the range.

5 Sketch the graph of each of the following functions and state its range:

    a $f(x) = \begin{cases} 2x & \text{if } x \geq 0 \\ -x + 2 & \text{if } x < 0 \end{cases}$ **b** $f(x) = \begin{cases} 2x + 6 & \text{if } x \geq 2 \\ -x + 2 & \text{if } x < 2 \end{cases}$

6 Find the inverse of each of the following functions. State the domain of the inverse function:

    a $f: [-1, 4] \to R$, $f(x) = 10 - 9x$

    b $f: (-6, \infty) \to R$, $f(x) = (x + 7)^2$

    c $f: [-1, \infty) \to R$, $f(x) = (x + 1)^2 + 2$

7 Sketch the graph of each of the following relations and state its range:

    a $(x + 7)^2 + (y - 7)^2 = 10$

    b $y = x^2 + 2x - 3$