5. [8 points] The graph of the function f defined on the domain $[0, 4]$ is drawn below.

$$y = f(x) \qquad\qquad\qquad y = f^{-1}(x)$$
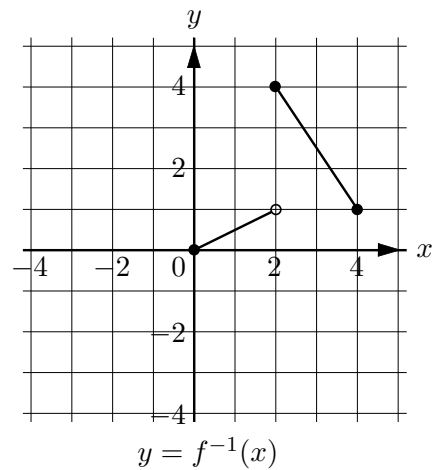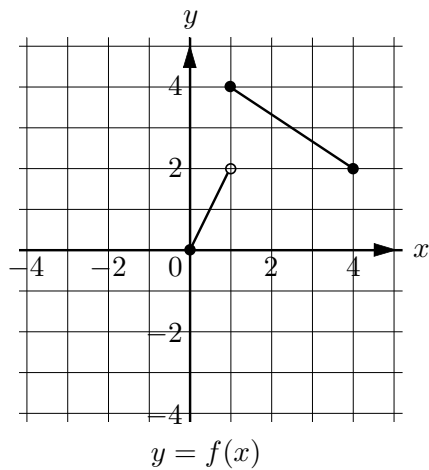
a. [4 points] Using the axis above (labelled "$y = f^{-1}(x)$"), sketch the graph $y = f^{-1}(x)$.

b. [4 points] Write down a piecewise formula for the function f.

Solution:

$$f(x) = \begin{cases} 2x & 0 \le x < 1. \\[2mm] 4 - \dfrac{2}{3}(x - 1) & 1 \le x \le 4. \end{cases}$$

6. [6 points] Let g be a function defined on the real line. Some values of g are shown below.

x	0	1	2	3
$g(x)$	0	5	6	7

a. [2 points] If g were an odd function, what should the value of $g(-1)$ be?

Solution: $g(-1) = -g(1) = -5$

b. [2 points] If g were a periodic function of period 5, what should the value of $g(-3)$ be?

Solution: $g(-3) = g(-3 + 5) = g(2) = 6$

c. [2 points] Let k be the function defined by $k(x) = g(2x + 5)$. What is $k(-1)$?

Solution: $k(-1) = g(2(-1) + 5) = g(3) = 7$.