Name: _____    Score: _____

Teacher: _____    Date: _____

# Inverse functions

**1-** Find the inverse for each of these functions.

     **(a)** $f(x) = 3x$      **(b)** $f(x) = 3x + 5$      **(c)** $f(x) = \dfrac{2x+5}{3}$      **(d)** $f(x) = \dfrac{2}{3}x + 5$
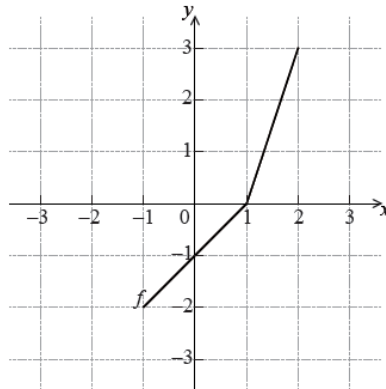
     **(e)** $g(x) = x^2 + 3$      **(f)** $g(x) = (x + 3)^2$      **(g)** $g(x) = 2x^2 - 5$      **(h)** $g(x) = \dfrac{x}{4-x}$, $x \neq -4$

     **(i)** $h(x) = \sqrt{x} + 3$      **(j)** $h(x) = \dfrac{1}{x} + 2$      **(k)** $h(x) = \sqrt{x - 2}$      **(l)** $h(x) = \dfrac{3x}{2 + x}$, $x \neq 2$

**2-** Find $f^{-1}(x)$

     **(a)** $f(x) = 1 - x$      **(b)** $f(x) = \dfrac{1}{x}$, $x \neq 1$      **(c)** $f(x) = x$      **(d)** $f(x) = \dfrac{x+3}{x-1}$, $x \neq 1$

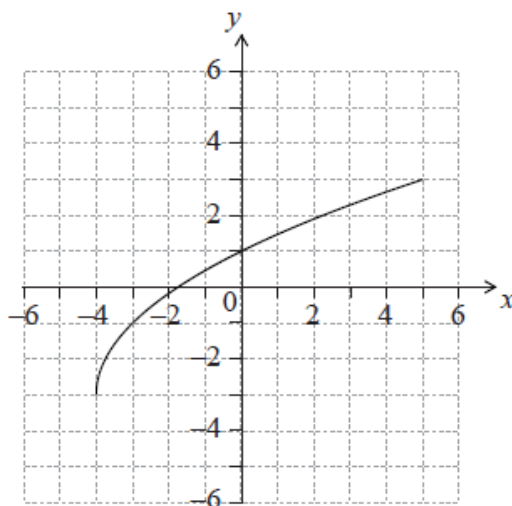**3-** The diagram below shows the graph of a function $f$, for $-1 \le x \le 2$.



(a) Write down the value of $f(2)$.

(b) Write down the value of $f^{-1}(-1)$.

(c) Copy the graph and sketch the graph of $f^{-1}$ on the grid

**4.** The following diagram shows the graph of $y = f(x)$, for $-4 \le x \le 5$.



(a) Write down the value of $f(-3)$.

(b) Write down the value of $f^{-1}(1)$.

(c) Find the domain of $f^{-1}$.

(d) Copy the graph and sketch the graph of $f^{-1}$.

**5-** Given $f(x) = 3x - 2$ and $g(x) = \frac{5}{3x}$, for $x \ne 0$, find

(a) Find $f^{-1}(x)$.

(b) Find $(g \circ f^{-1})(3)$

# Solutions

**1-**

(a) $\frac{x}{3}$  (b) $\frac{x-5}{3}$  (c) $\frac{3x-5}{2}$  (d) $\frac{3(x-5)}{2}$

(e) $\sqrt{x-3}$  (f) $\sqrt{x}-3$  (g) $\sqrt{\frac{x+5}{2}}$  (h) $\frac{4x}{x+1}$

(i) $(x-3)^2$  (j) $\frac{1}{x-2}$  (k) $x^2+2$  (l) $\frac{2x}{3-x}$
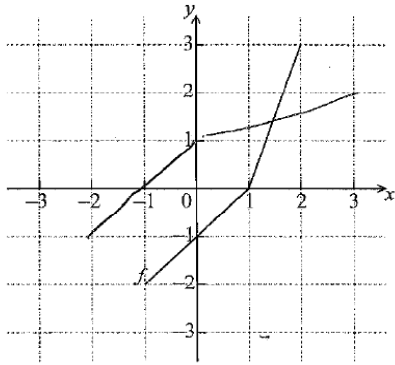
**2-**

(a) $1-x$  (b) $\frac{1}{x}$  (c) $x$  (d) $\frac{3+x}{x-1}$

**3- (a)** $f(2) = 3$
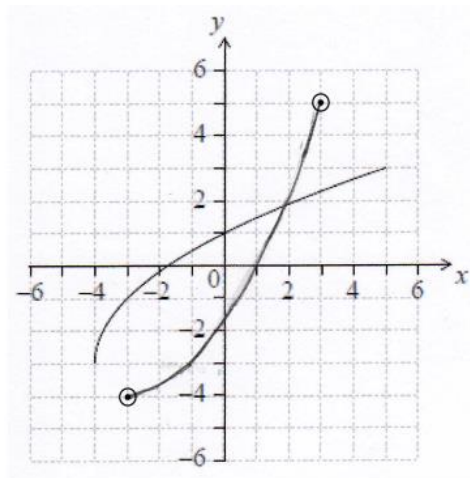
**(b)** $f^{-1}(-1) = 0$

**(c)**



**4-**

(a) $f(-3) = -1$

(b) $f^{-1}(1) = 0$

(c) domain of $f^{-1}$ is $-3 \le x \le 3$

(d)



**5- (a)** $\frac{x+2}{3}$

(b) $(g \circ f^{-1})(3) = 1$