

Name: \_\_\_\_\_ Score: \_\_\_\_\_

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## Inverse functions

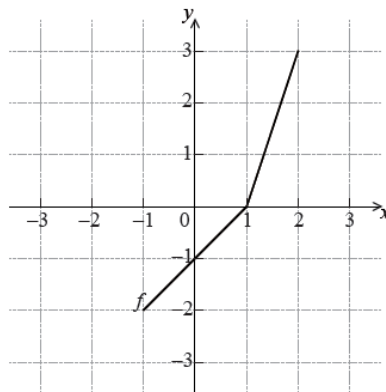
1- Find the inverse for each of these functions.

- (a)  $f(x) = 3x$       (b)  $f(x) = 3x + 5$       (c)  $f(x) = \frac{2x+5}{3}$       (d)  $f(x) = \frac{2}{3}x + 5$
- (e)  $g(x) = x^2 + 3$       (f)  $g(x) = (x+3)^2$       (g)  $g(x) = 2x^2 - 5$       (h)  $g(x) = \frac{x}{4-x}, x \neq 4$
- (i)  $h(x) = \sqrt{x} + 3$       (j)  $h(x) = \frac{1}{x} + 2$       (k)  $h(x) = \sqrt{x-2}$       (l)  $h(x) = \frac{3x}{2+x}, x \neq 2$

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

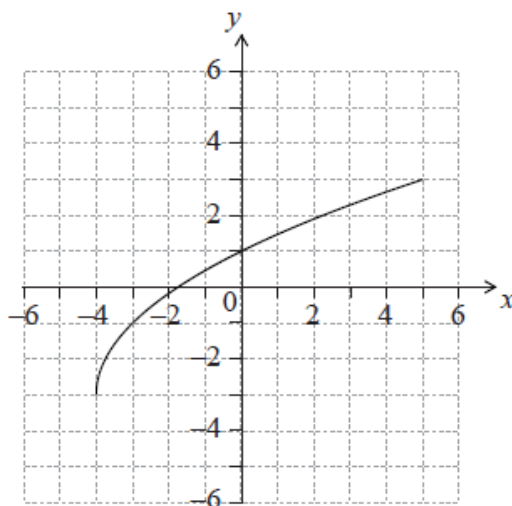
- (a)  $f(x) = 1 - x$       (b)  $f(x) = \frac{1}{x}, x \neq 1$       (c)  $f(x) = x$       (d)  $f(x) = \frac{x+3}{x-1}, x \neq 1$

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



- (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  $-4 \leq x \leq 5$ .



- (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  $x \neq 0$ , 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)  $\frac{1}{x}$

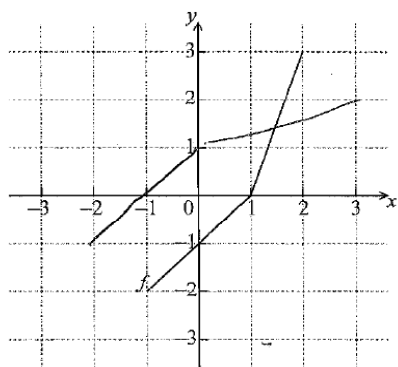
(c)  $x$

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

3- (a)  $f(2) = 3$

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

(c)



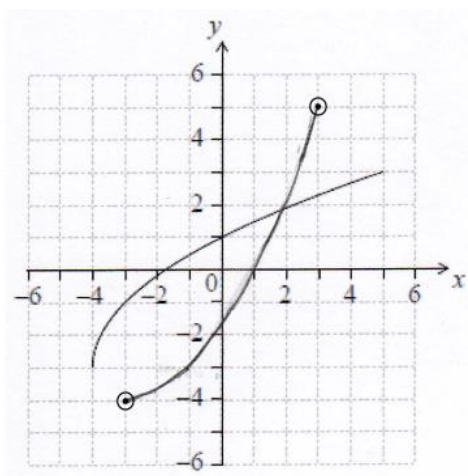
4-

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

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

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

(d)



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

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