

Question 1

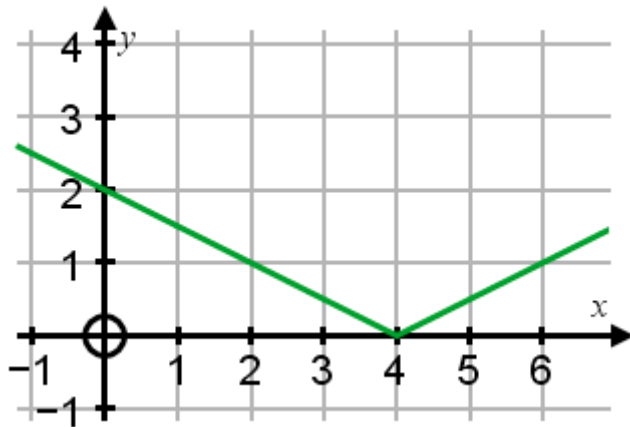
What is the range of $f(x) = 2^x$, where $x \in \mathbb{R}$?

Question 2

If $f(x) = x - 4$ and $g(x) = x^2$, what is $gf(2)$?

Question 3

The graph of $y = f(x)$ is drawn below.



Use the graph to find the value of $f(2)$.

Question 4

Suggest an appropriate domain for $f(x) = \frac{1}{3x-1}$.

(An 'appropriate' domain would be one which is large as possible)

Question 5

What is the range of $f(x) = \sqrt{x-3}$, where $x \geq 3$?

Question 6

If $f(x) = 3^x$ and $g(x) = x + 1$, determine $fg(x)$.

Question 7

Suggest an appropriate domain for $f(x) = \sqrt{2x-1}$.

(An 'appropriate' domain would be one which is large as possible)

Question 8

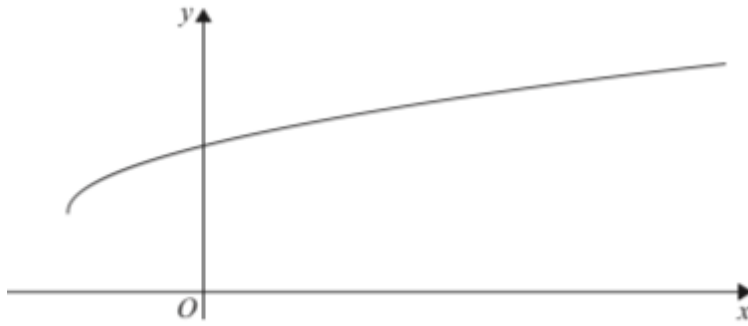


Figure 1

Figure 1 shows a sketch of part of the graph of $y = g(x)$, where

$$g(x) = 3 + \sqrt{x+2}, \quad x \geq -2$$

Find $g^{-1}(x)$.

Question 9

The functions f and g are defined by

$$f: x \rightarrow \ln(2x - 1), \quad x \in \mathbb{R}, \quad x > \frac{1}{2}$$

$$g: x \rightarrow \frac{2}{x-3}, \quad x \in \mathbb{R}, \quad x \neq 3$$

Find the exact value of $fg(4)$.

Question 10

If $f(x) = 2^{x+1}$, what is $f^{-1}(x)$?

Question 11

$f(x) = x^2 + 3x - 5$ and $g(x) = 4x + k$, where k is a constant.

a) Given that $f(3) = g(3)$, find the value of k .

b) Find the values of x for which $f(x) = g(x)$, giving your solutions in **ascending order**.

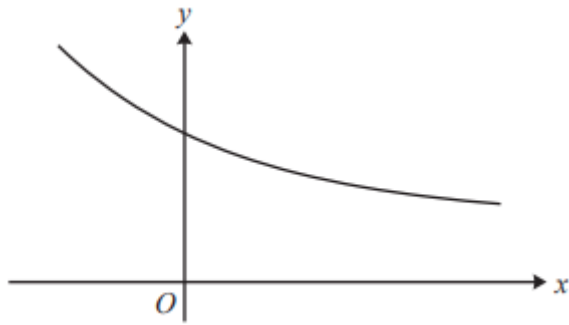
Question 12

If $f(x) = \frac{x-3}{2x+1}$, determine $f^{-1}(x)$.

Question 13

If $f(x) = 2x^2 - 1$, find $ff(x)$, expanding and simplifying your answer.

Question 14



The diagram shows the curve $y = f(x)$, where f is the function defined for all real values of x by

$$f(x) = 3 + 4e^{-x}$$

Find an expression for $f^{-1}(x)$.
