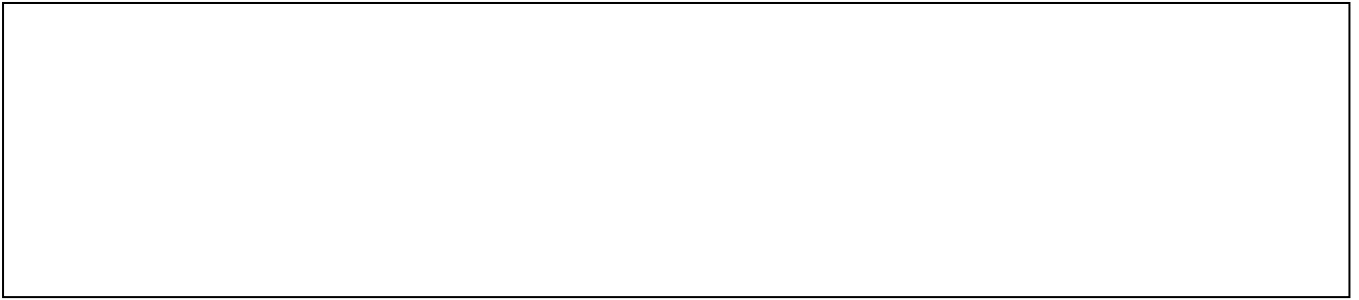


Inverse Functions



Why must the function be one-to-one for an inverse function to exist?

How do we find an inverse function?

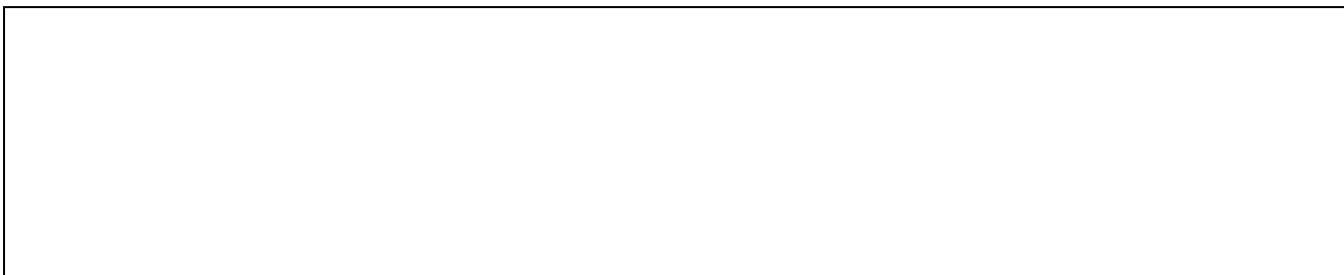
Example

Steps

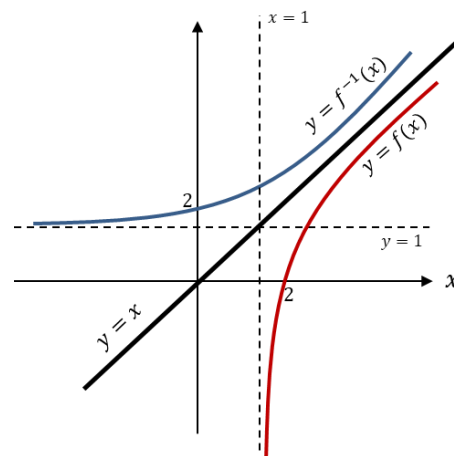
1. If $f(x) = 3 - 4x$, find $f^{-1}(x)$

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

Graphing an Inverse Function



The domain of $f(x)$ is the range of $f^{-1}(x)$ and vice versa.



Example

If $g(x)$ is defined as $g(x) = \sqrt{x-2}$ $\{x \in \mathbb{R}, x \geq 2\}$

- Find the range of $g(x)$.
- Calculate $g^{-1}(x)$
- Sketch the graphs of both functions.
- State the domain and range of $g^{-1}(x)$.

Test your understanding

The function f is defined by

$$f: x \rightarrow e^x + 2, \quad x \in \mathbb{R}$$

(a) Find f^{-1} , the inverse function of f , stating its domain.

(b) On the same axes sketch the curves with equation $y = f(x)$ and $y = f^{-1}(x)$, giving the coordinates of all the points where the curves cross the axes.