

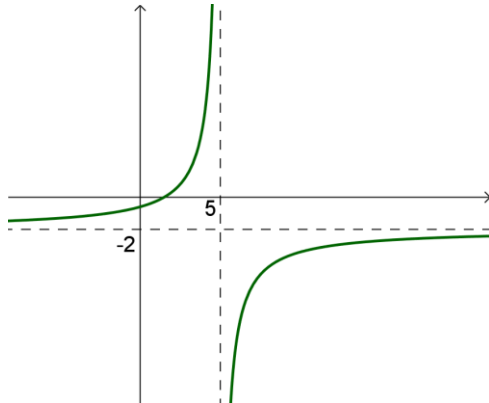
Section 2: Composite and inverse functions

Exercise level 2

1. The function
- f
- is defined as:

$$f(x) = \frac{3-2x}{x-5}, \quad x \in \mathbb{R}, x \neq 5.$$

The graph of $y = f(x)$ is shown below. The graph has a vertical asymptote at $x = 5$ and a horizontal asymptote at $y = -2$.



- State the range of $f(x)$.
- Find $f^{-1}(x)$ and state its domain and range.
- The gradient the curve $y = f(x)$ at the point $(4,5)$ is 7. Write down the gradient of $y = f^{-1}(x)$ at the point where $x = 5$.

2. The function
- f
- is defined as:

$$f(x) = \frac{1}{3-x}, \quad x \in \mathbb{R}, x \neq 3$$

- State the range of $f(x)$.
- Find $ff(x)$ and state its domain.
- Find $f^{-1}(x)$ and state its domain and range.

3. The functions
- f
- and
- g
- are defined as:

$$f(x) = x^2 - 2, \quad x \in \mathbb{R}$$

$$g(x) = \frac{1}{x}, \quad x \in \mathbb{R}, x \neq 0$$

- State the range of $f(x)$.
 - Find $gf(x)$ and state its domain.
 - Find $gg(x)$ and interpret your answer.
 - Find $(fg)^{-1}(x)$
4. The functions f and g are defined as:

$$f(x) = e^x, \quad x \in \mathbb{R}$$

$$g(x) = x^2, \quad x \in \mathbb{R}$$

Express in terms of f and g .

- e^{2x} , $x \in \mathbb{R}$

Edexcel A level Maths Functions 2 Exercise

(ii) e^{4x} , $x \in \mathbb{R}$

(iii) e^{2x^2} , $x \in \mathbb{R}$

(iv) $e^{\sqrt{x}}$, $x \in \mathbb{R}$

5. The functions f and g are defined as:

$$f(x) = 2x, \quad x \in \mathbb{R}$$

$$g(x) = \sin x, \quad x \in \mathbb{R}$$

(i) Find $fg(x)$

(ii) Find $(fg)^{-1}(x)$