Functions

1. [A1] Functions $f(x) = x^2 + 5$ and $g(x) = 2x + 1$ are defined on suitable domains.

(a) Find an expression for $h(x)$ where $h(x) = f\big(g(x)\big)$.

(b) Write $h(x)$ in the form $a(x + b)^2 + c$.

(c) Make a sketch of $h(x)$, showing the turning point and where it intersects the $y - axis$.

2. [A1] Functions $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = x^2 - x - 6$ are defined on suitable domains.

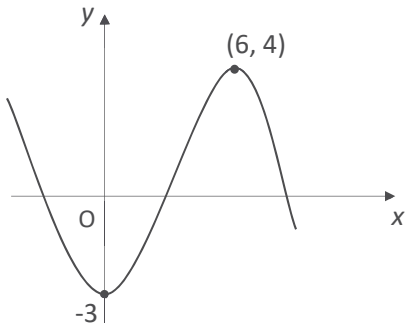
(a) Find an expression for $h(x)$ where $h(x) = f\big(g(x)\big)$.

(b) Determine any restriction on the domain of $h(x)$.

3. [A4] The function $f(x) = \frac{x-3}{5}$ is defined on a suitable domain.

Find the inverse function $f^{-1}(x)$.

4. [A3, A5] The diagram shows the curve of $y = f(x)$.



(a) Sketch the curve of $y = f(2x)$.

(b) Sketch the curve $y = -f(x) + 4$.

(c) Sketch a possible graph of $y = f'(x)$.