

Functions 3 – www.m4ths.com

(1) 2 different functions are given below:

$$f(x) = x^2 - 4$$

$$g(x) = x + 1$$

- (a) Show that $fg(x)$ can be written as $(x+3)(x-1)$.
- (b) Hence solve $fg(x) = 0$
- (c) Show that $fg(x)$ and $gf(x)$ are not the same.
- (d) Sketch the graph of $y = gf(x)$.

(2) 2 different functions are given below:

$$f(x) = 2x - 1$$

$$g(x) = x^3$$

- (a) Sketch the graphs of the two functions.

- (b) Using algebra, find $f^{-1}(x)$.
- (c) Using algebra, find $f^{-1}(x) = f(x)$
- (d) Given that $fg(x) = ax^3 + b$, find the values of a and b .
- (e) Plot the graph of $y = g^{-1}(x)$ for $-8 \leq x \leq 8$.
- (f) Show that $ggg(x) = x^{27}$.

(3) 2 different functions are given below:

$$g(x) = x^2$$

$$fg(x) = 2x - 1$$

- (a). Find an expression for $f(x)$.
- (b) $fg(x) = g(x)$ can be written as $(x-1)^2 = 0$
- (c) Hence write down the only solutions to $fg(x) = g(x)$
- (d) Sketch the graph of $y = f^{-1}(x)$