SPTA
Higher Homework
Functions (B)

1. Functions f and g are such that $f(x) = x + 2$ and $g(x) = x^2$

   Find $g(f(-3))$ **(2)**

2. The functions f and g are defined on a suitable domain by $f(x) = x^2 - 1$ and $g(x) = x^2 + 2$

   (a) Find an expression for $f(g(x))$ **(2)**
   (b) Factorise $f(g(x))$ **(1)**

3. Two functions are given by $f(x) = 1 - 2x^2$ and $g(x) = sinx$

   Find, in their simplest forms, formulae for

   (a) $f(g(x))$ **(b)** $g(f(x))$ **(c)** $f(f(x))$ **(7)**

4. Functions k and h are defined on the set of real numbers by $k(x) = \frac{2x-5}{3}$ and $h(x) = \frac{3x+5}{2}$

   (a) Find $k(h(x))$ and $h(k(x))$ **(4)**
   (b) What can you say about functions k and h ? **(1)**

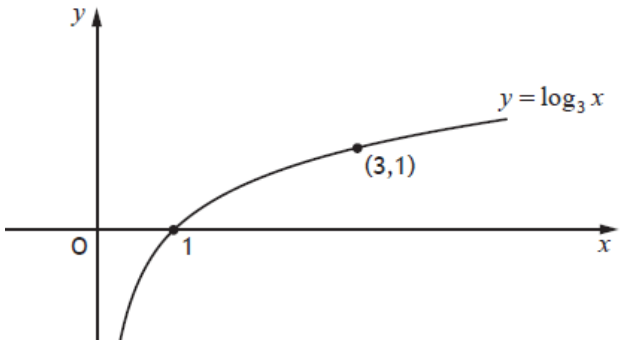
5. For each function find $f^{-1}(x)$

   (a) $f(x) = 5 - 2x$ (b) $f(x) = \frac{x^2}{2} + 1$ **(4)**

6. The diagram shows the graph of the function $f(x) = \log_3 x$, where x > 0.

   The inverse function, $f^{-1}(x)$ exists.

   Sketch the graph of this inverse function



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