



Ross High School: Mathematics Department

Higher Mathematics: Homework 11

1. Three functions, $g(x)$, $h(x)$ and $j(x)$ are defined by:

$$\begin{aligned}g(x) &= 3x + 2 \\h(x) &= 5 - x^2 \\j(x) &= \sqrt{x}\end{aligned}$$

- a) Find an expression for:

i. $h(g(x))$

ii. $g(h(x))$

iii. $h(h(x))$

(6)

- b) For the expression $j(g(x))$, show that a suitable domain for x would be $x \geq -\frac{2}{3}$

(3)

- 2.

Three functions f , g and h are defined, on suitable domains, as follows:

$$f(x) = \frac{1}{3}x$$

$$g(x) = 2x - 5$$

$$h(x) = \frac{1}{2}(3x + 5)$$

- (a) Calculate $k(x) = f(g(x))$.

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- (b) (i) Find $h(k(x))$ and $k(h(x))$.

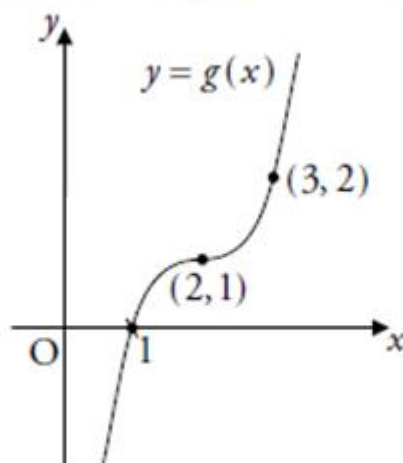
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- (ii) Hence state the relationship between the functions h and k .

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- 3.

The diagram below shows the graph of $y = g(x)$.



Sketch the graph of the inverse function of g , showing three points on the curve.

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