

A-level MATHS Functions and transformations

Mark scheme

Specification content coverage: B6, B7, B8, B9

Question	Solutions		Mark
1	Quotient $2x^2 + 4x + 6$		1
			1
	Remainder = 6		1
		Total	3
2 (a)	(2x+3)(x-4)		1
		Total	1
2 (b)	(2x+3)(x-4)		
	$\frac{(2x+3)(x-4)}{(x+3)(x-4)}$		1
	$\frac{2x+3}{2}$		1
	x+3	Total	2
3		TOLAI	1
3	a = 2 $b = 4$		1
	b = 4	Total	2
4	1 1		
4	$x = \frac{1}{1-y}, 1-y = \frac{1}{x}$		1
	$g^{-1}(x) = \frac{x-1}{x}$ or $1 - \frac{1}{x}$		1
	$g^{2}(x) = \frac{1}{1 - \frac{1}{1 - x}}$		1
	$g^{2}(x) = \frac{x-1}{x}$		1
		Total	4
5	$3x - 4 = 5 - x$ or $(3x - 4)^2 = (5 - x)^2$		1
	$4 - 3x = 5 - x \text{ or } 9x^2 - 24x + 16 = 25 - 10x + x^2$		1 1
	$x = 2.25 \text{ or } 8x^2 - 14x - 9 = 0$		1
	x = -0.5 or $x = 2.25, -0.5$	Tatal	4
		Total	4

intersections w the axes) x = 3 - x and $2x - 5 = x - 31$			
$\begin{bmatrix} g^{-1}(x) = x^{2} + 3 & 1 \\ \frac{x+11}{3} = x^{2} + 3 & 1 \\ 3x^{2} + 9 = x + 11 & 3x^{2} - x - 2 = 0 & 1 \\ (3x+2)(x-1) = 0 & 1 & 2 \\ x = -\frac{2}{3}, 1 & 2 & 1 \\ \hline 7 & & & & & & & \\ \hline 7 & & & & & & & & \\ y & & & & & & & & \\ \hline 3 & & & & & & & & & \\ y & & & & & & & & &$	6	$f^{-1}(x) = \frac{x+11}{3}$	1
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		$g^{-1}(x) = x^2 + 3$	1
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$			1
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$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			
$x = -\frac{2}{3}, 1$ $x = -\frac{2}{3}, 1$ $x = -\frac{2}{3}, 1$ z			
Total 6 7 y y y y y y y y		(3x+2)(x-1)=0	1
Total 6 7 y y y y y y y y		$x = -\frac{2}{3}, 1$	2
2 (1 mark for each correct graph including intersections w the axes) 2x-5=3-x and $2x-5=x-31$			6
	7		each correct graph including intersections with
$x = \frac{8}{3}, 2$			1
		$x = \frac{8}{3}, 2$ $2 < x < \frac{8}{3}$	
$2 < x < \frac{8}{3} $		$2 < x < \frac{8}{3}$	1
Total 4		Total	4

