

**Question 6 (Total 10 marks)**

Part	Working or answer an examiner might expect to see	Mark	Notes
(a)	$gg(0) = g(10)$	M1	This mark is given for a method to find $gg(0)$
	$g(10) = 22$	A1	This mark is given for a correct value for $gg(0)$
(b)	$(x - 3)^2 + 1 > 9$ $(x - 3) > \pm \sqrt{8}$ $x > 3 + 2\sqrt{2}, x < 3 - 2\sqrt{2}$	M1	This mark is given for a method to solve $g(x) > 9$ when $x \leq 3$
	$x < 3 - 2\sqrt{2}$	A1	This mark is given for the correct answer only
	$3x - 8 > 9$ $x > \frac{17}{3}$	M1	This mark is given for a solving $g(x) < 9$ when $x < 0$
	$x < 3 - 2\sqrt{2}$ or $x > \frac{17}{3}$	A1	This mark is given for a correct range of values of $x$ for which $g(x) < 9$ stated
(c)	$h^{-1}$ exists since $h$ is a one-to-one function; $g^{-1}$ does not exist since $g$ is a many-to-one function	B1	This mark is given for a valid explanation
(d)	$h^{-1}(x) = 6 - \sqrt{(x - 6)}$	B1	This mark is given for finding an expression for $h^{-1}(x)$ . Note the negative root is taken since the domain of $h(x)$ is $x \leq 6$ , so $h(x) \leq 6$ also
	$6 - \sqrt{(x - 6)} = -2$ $\sqrt{(x - 6)} = 8$	M1	This mark is given for a method to rearrange to find a value for $x$
	$x = 70$	A1	This mark is given for a correct value of $x$