Question	Scheme	Marks	AOs
7 (a)	$\mathrm{g}\left(-\frac{1}{2}\right)=4\times-\frac{1}{8}+a\times\frac{1}{4}+4\times-\frac{1}{2}+b=0$ $(a+4b=10)$	M1	2.1
	$\mathrm{g}''(x)=24x+2a$	B1	1.1b
	$\mathrm{g}''\left(\frac{1}{6}\right)=4+2a=0$	M1	2.1
	Solves to find values for *a* and *b*	M1	3.1a
	$a=-2, b=3$	A1	1.1b
		(5)	
(b)	Finds $\mathrm{g}'(x)=12x^2-4x+4$ for their value of *a* and attempts show that it cannot $=0$ e.g. $12x^2-4x+4=12\left(x-\frac{1}{6}\right)^2+\frac{11}{3}$	M1	3.1a
	For all *x*, $\mathrm{g}'(x)>0$ Hence $\mathrm{g}'(x)\neq 0$ so no stationary points.	A1	2.4
		(2)	
		(7 marks)	

Notes:

(a)

M1: Identifies the fact that $(2x+1)$ is a factor to deduce that $\mathrm{g}\left(-\frac{1}{2}\right)=4\times-\frac{1}{8}+a\times\frac{1}{4}+4\times-\frac{1}{2}+b=0$

B1: Differentiates twice to state (or use) $\mathrm{g}''(x)=24x+2a$

M1: Identifies the fact that $y=\mathrm{g}(x)$ has a point of inflection when $x=\frac{1}{6}$ to deduce that

$\mathrm{g}''\left(\frac{1}{6}\right)=4+2a=0$

M1: A complete method to find values for *a* and *b*

A1: $a=-2, b=3$

(b)

M1: Finds $\mathrm{g}'(x)=12x^2-4x+4$ for their value of *a* and attempts show that it cannot $=0$

E.g. Attempts to show that $\mathrm{g}'(x)>0$, or attempts to solve $\mathrm{g}'(x)=0$

A1: For all *x*, $\mathrm{g}'(x)>0$ Hence $\mathrm{g}'(x)\neq 0$ so no stationary points.