Question Number	Scheme	Marks
1 (a)	$54=\frac{9}{2}(2a+8d)$ $\Rightarrow a+4d=6$ *	M1 A1* **(2)**
(b)	Correct equation $a+7d=\frac{1}{2}(a+6d)$	B1 (M1 on EPEN)
	Substitutes or eliminate terms $\Rightarrow 6-4d+7d=\frac{1}{2}(6-4d+6d)$ $\Rightarrow d=...$ (or $a=...$)	M1
	$d=-1.5$ (o.e.) , $a=12$	A1, A1 **(4)**
		(6 marks)

(a)

M1: Attempts to use e.g. $S_9=\frac{9}{2}(2a+8d)$ or $S_9=\frac{9}{2}(2a+(9-1)d)$ with $S_9=54$

Alternatively uses $S_9=\frac{9}{2}(a+l)$ with $S_9=54$ and $l=a+8d$

or lists terms $a+a+d+...+a+8d=54\Rightarrow 9a+36d=54$ scored when a correct equation is achieved (i.e. without …).

There is no need to see the notation S_9

A1*: Proceeds to the given answer via a correct equation as in the main scheme.

There is no need to see any rearranging between this and the given answer.

Just $9a+36d=54\Rightarrow a+4d=6$ scores M0A0*: a valid formula or listing of terms in a sum must be seen.

(b)

B1: Correct equation e.g., $a+7d=\frac{1}{2}(a+6d)$ or $2(a+(8-1)d)=a+(7-1)d$

There is no need to see any notation e.g. u_8

Note that the simplified equation is $a+8d=0$

M1: Uses both equations, condoning a slip such as misplacing the $\frac{1}{2}$, e.g., $\frac{1}{2}(a+7d)=a+6d$,

and solves simultaneously to find a value for a **or** d.

This mark depends on the use of acceptable expressions for u_7 and u_8.

Don't be concerned with the process of solving their simultaneous equations provided they have two acceptable equations and arrive at a solution for a **or** d.