Question	Scheme	Marks	AOs
3 (a)	Attempts to solve $10-6k=2k-10\Rightarrow k=...$	M1	3.1a
	$\left(k=\right)\frac{5}{2}$ o.e.	A1	1.1b
		(2)	
(b)	Deduces the value of "d" $=-5$	B1 ft	2.2a
	$S_{50}=\frac{50}{2}\left(2\times"15"+49\times"-5"\right)$	M1	1.1b
	$=-5375$	A1	1.1b
		(3)	
			(5 marks)

Notes:

(a) Condone using other letters for *a* and *d* (e.g. may use *r* for *d*)

M1: Attempts a valid method to solve the problem

- Uses the common difference to form a correct equation and attempts to solve to find a value for k

  e.g. Attempts to solve $10-6k=2k-10$ o.e such as $2k-6k=2\left(10-6k\right)$
- Uses 10 as the mean of $2k$ and $6k$: $\frac{2k+6k}{2}=10\Rightarrow k=...$
- Sets up correct equations $a=6k,\ a+d=10$ and $a+2d=2k,$ or may be seen as $6k+d=10$ and $10+d=2k$, **and** proceeds to find k.
- Uses the summation formula $S_3=\frac{3}{2}\left(6k+2k\right)=6k+10+2k$ **and** proceeds to find k

In each attempt the initial equation (or simultaneous equations) must be correct but do not be concerned by the mechanics of the rearrangement to find k. May be implied by $k=\frac{5}{2}$

A1: $\left(k=\right)\frac{5}{2}$ o.e.

(b) Work seen in (a) can only be scored if seen or used in (b)

B1ft: Common difference $=-5$ **or** ft on their value for k (even if k has been found from an incorrect method) e.g. $10-6\times"\frac{5}{2}"$ or e.g. $2\times"\frac{5}{2}"-10$ if only a numerical value is seen.

May be implied or seen in a term or summation formula.

Note that some candidates may work in terms of k throughout so only allow B1ft to be scored when they substitute in their numerical value for k, following $10-6k$ o.e. correctly embedded in a correct formula. They may make arithmetical slips before they substitute in their numerical value for k which can be condoned.

M1: Attempts to use a **correct formula**. The expression is sufficient to score this mark but they must be using a correct value for a and $\pm d$ (or ft on their value for k for a and d) which are correctly placed in the formula.

e.g. $\left(S_{50}=\right)\frac{50}{2}\left(2\times"6k"+49\times"\pm d"\right)$.

Alternatively, they may find the 50th term $u_{50}="15"+(50-1)\times"-5"=-230$ and use $\left(S_{50}=\right)\frac{50}{2}\left("15"+"-230"\right)$.

If working in terms of k they must substitute in their value for k

e.g. $\left(S_{50}=\right)\frac{50}{2}\left(2\times6k+49\times(10-6k)\right)=-7050k+12250=-7050\times"\frac{5}{2}"+12250$

Do not withhold this mark for omission of brackets around (-5)

e.g. $\frac{50}{2}\left(2\times15+\left(49\right)-5\right)$ scores M1

A1: -5375 cao