Question	Scheme	Marks	AOs
8 (a)	e.g. The last line should start $25k^2+20k+4$	B1	2.3
		(1)	
(b)	Considers one of the missing calculations $m=5k+3$ and attempts $m^2=(5k+3)^2=...$ **or** $m=5k+4$ and attempts $m^2=(5k+4)^2=...$	M1	2.1
	Achieves one correct statement $m^2=(5k+3)^2=25k^2+30k+9=5\left(5k^2+6k+2\right)-1$ **or** $m^2=(5k+4)^2=25k^2+40k+16=5\left(5k^2+8k+3\right)+1$	A1	1.1b
	Considers **both** of the missing calculations	dM1	1.1b
	Achieves both correct statements with final concluding remark (see notes)	A1	2.1
		(4)	
			(5 marks)

Notes:

(a)

B1: Corrects the error for the case when $m=5k+2$. The correction may be on the proof in the box or may be described in the main body of the text. May just see the $10k$ crossed out and replaced with $20k$ in the box or described in the main body of the work.
Sight of the quadratic $\left(25k^2\right)+20k\ (+4)$ scores B1 and isw e.g. if they make other errors in the expansion.
If B1 is not scored in (a) then allow to score if seen correct in (b) e.g. they may attempt the case $m=5k+2$ as part of their proof in (b).

(b) **Main scheme method uses** $m=5k+3$ and $m=5k+4$

You will need to look at both cases and mark the one which is fully correct first.
Allow a different variable to k and may be different letters for the two cases.
If a candidate attempts repeated cases e.g. $m=5k+4$ and $m=5k-1$ then mark both and award the higher mark of the two.
Condone use of *m* as a variable for the first three marks.
There should be no errors in the algebra for the A marks including invisible brackets but do not be concerned with any re-attempt at doing the case $m=5k+2$

Note that there are other allowable valid pairs of combinations covering the final two distinct cases e.g. $m=5k-2$ **and** $m=5k+4$**, or** $m=5k-1$ **and** $m=5k+3$ **but NOT e.g.** $m=5k+3$ **and** $m=5k-2$

Note that we are not expecting candidates to state what set of numbers *k* belongs to but we will condone pairs such as $m=-5k-1$ **and** $m=-5k-2$

Typically candidates will show the algebraic steps as in the main scheme but for this particular pair they may justify equivalence using the results in the box for $m=5k+1$ **and** $m=5k+2$ without requiring calculations which is acceptable.

M1: Considers one valid case e.g. $m=5k+3$ and attempts $m^2=(5k+3)^2$ **or** $m=5k+4$ and attempts $m^2=(5k+4)^2$

Look for expanding out the brackets and simplifying to a 3TQ. Condone slips.

A1: Achieves one correct statement which includes the case, the quadratic multiplied out and written in the required form

e.g. $m^2=(5k+3)^2=25k^2+30k+9=5\left(5k^2+6k+2\right)-1$ **or**

e.g. $m^2=(5k+4)^2=25k^2+40k+16=5\left(5k^2+8k+3\right)+1$

dM1: Considers **both cases** for a valid pair (see first M1 for guidance). It is dependent on the previous method mark. Condone slips.

A1: Full proof with correct statements for both cases for a valid pair. Each must include the case, the quadratic multiplied out and written in the form which is not in terms of *m* (we do not need the "where $n=....$" at the end of the statements - you can ignore these)

Requires a minimal overall conclusion eg. Proven, QED, tick

Condone recovery of interchanging of variables.

m	m^2	$5n\pm1$
$5k+3$	$25k^2+30k+9$	$5\left(5k^2+6k+2\right)-1$
$5k+4$	$25k^2+40k+16$	$5\left(5k^2+8k+3\right)+1$
$5k-1$	$25k^2-10k+1$	$5\left(5k^2-2k\right)+1$
$5k-2$	$25k^2-20k+4$	$5\left(5k^2-4k+1\right)-1$

Ignore any additional cases that are not required to complete the proof

(and ignore replications of the ones given in the box in the question)