Question Number	Scheme	Marks
1 (a)	$78+17\times-3=27$	M1, A1 **(2)**
(b)	$\frac{100}{2}(2\times78+99\times-3)$	M1
	$=-7050$	A1 **(2)** **(4 marks)**

(a)

M1: Attempts to find the value of $a+(n-1)d$ with $a = 78$, $n = 18$ and $d = -3$. E.g.

Award for $78+17\times-3=...$

Condone slips, so for example 78 written as 87…

BUT writing 78 as 18 (which is the value of n) or -3 as 3 are not regarded as slips

Writing down 27 scores both marks

Listing is acceptable only if they write down 27 as the answer

A1: 27

(b)

M1: Attempts the correct sum formula for 100 terms. So $n = 100$ must be used (twice).

Condone with $d=\pm3$ and slips on 78 …. BUT writing 78 as 18 is not regarded as a slip

Award for an attempt at $\frac{100}{2}(2\times78+99\times-3)$ or $\frac{100}{2}(2\times78+99\times3)$ o.e.

Writing down -7050 scores both marks

You may see the alternative formula used, usually seen with an attempt to find u_{100} first.

Look for $\frac{100}{2}(78+u_{100})$ condoning the same slips on 78 and u_{100} found via $78+99\times\pm3$

A1: -7050 but this is not isw. Withhold this mark if they write -7050 and follow this with 7050

Guidance on applications of formulae for this question:

If a candidate writes out a fully correct formula including bracketing, followed by the correct embedded values they can be awarded M1.
E.g. $n^{\text{th}}\ \text{term} = a + (n-1)d \Rightarrow 18^{\text{th}}\ \text{term} = 78 + (18-1) - 3 = 92$ should be awarded M1, A0 as the correct formula and embedded values are seen

However, $18^{\text{th}}\ \text{term} = 78 + (18-1) - 3 = 92$ should be awarded M0 as the correct formula cannot be implied

Similarly writing $18^{\text{th}}\ \text{term} = 78 + 19 \times -3 = \ldots$ should be awarded M0, A0 as it implies the incorrect formula $a + (n+1)d$

Question Number	Scheme	Marks
2	$(1+px)^{10} = 1+10px+\frac{10\times 9}{2}p^2x^2+\frac{10\times 9\times 8}{6}p^3x^3+\ldots$	
	Sets $10p=15 \Rightarrow p=1.5$ o.e.	M1 A1
	Finds the value of $45p^2 \Rightarrow q=101.25$ o.e.	M1 A1
	Finds the value of $120p^3 \Rightarrow r=405$	M1 A1
		(6) **(6 marks)**

M1: Sets $10p=15 \Rightarrow p=\ldots$ or $10px=15x \Rightarrow p=\ldots$

Alternatively score for a correct simplified expansion of $(1+px)^{10} = 1+10px+45p^2x^2+120p^3x^3+\ldots$

A1: $p=1.5$ o.e. Candidates who simply state that $p=1.5$ can be awarded M1, A1

M1: Finds a value for $45p^2$ or $\frac{10\times 9}{2}p^2x^2$ or equivalent using their value of *p* which may or may not have been found via a correct method.

A1: States a correct value for $q=101.25$ o.e following the award of M1

M1: Finds the value for $120p^3$ or $\frac{10\times 9\times 8}{3!}p^3x^3$ or equivalent using their value of *p* which may or may not have been found via a correct method.

A1: States a correct value for $r=405$ following the award of M1