

Question	Scheme	Marks	AOs
2(a)(i)	e.g. $(u_2 =)35 + 7 \cos\left(\frac{\pi}{2}\right) - 5(-1)^1 = 40$ *	B1*	2.1
(ii)	$u_3 = 40 + 7 \cos\left(\frac{2\pi}{2}\right) - 5(-1)^2 (=28)$ or $u_4 = "28" + 7 \cos\left(\frac{3\pi}{2}\right) - 5(-1)^3 (=33)$	M1	1.1b
	$u_3 = 28$ and $u_4 = 33$	A1	1.1b
		(3)	
(b)(i)	$(u_5 =)35$	B1	2.2a
(ii)	e.g. $\sum_{r=1}^{25} u_r = 6(35 + 40 + "28" + "33") + 35$	M1	3.1a
	$= 851$	A1	1.1b
		(3)	

(6 marks)

Notes

(a)

(i)

B1*: **Correct** application of the formula with $n = 1$ and proceeds correctly to achieve an answer of 40 with no errors. Note that e.g., $(u_2 =)35 + 7 \cos\left(\frac{35\pi}{2}\right) - 5(-1)^{35} = 35 + 0 + 5 = 40$ scores B0

As a minimum need to see e.g. $(u_2 =)35 + 7 \cos\left(\frac{\pi}{2}\right) - 5(-1)^1 = 40$, $35 + 0 + 5 = 40$, $35 + 5 = 40$, $35 - 5(-1)^1 = 40$

(ii)

M1: A correct attempt to use the formula to find a value for u_3 or u_4

Look for $n = 2$ substituted correctly into the given formula with $u_2 = 40$. May be implied by $u_3 = 28$

Or their calculated value of u_3 used with $n = 3$ substituted correctly into the given formula to find u_4

Condone use of calculator in degree mode which gives $u_3 = 41.989\dots$ which may imply this mark if no working is shown. If there is **no** working and u_3 is incorrect and u_4 is correct score M0A0

A1: Both correct $u_3 = 28$ and $u_4 = 33$ If 28, 33 are listed then allow M1A1.

For both correct values only score M1A1

(b)(i)

B1: $(u_5 =)35$

(ii)

M1: Attempts a **correct** method to find $\sum_{r=1}^{25} u_r$

There are various ways e.g. attempts to add 35 to $6 \times$ the sum of their four values.

Some other examples are:

$$\sum_{r=1}^{25} u_r = 7 \times 35 + 6 \times 40 + 6 \times "28" + 6 \times "33", \quad \sum_{r=1}^{25} u_r = 7(35 + 40 + "28" + "33") - (40 + "28" + "33"),$$

$$\sum_{r=1}^{25} u_r = \frac{25}{4}(35 + 40 + "28" + "33") + 1, \quad 2(35 + 40 + "28" + "33") = 272, \quad 272 \times 3 = 816, \quad 816 + 35$$

There may be other methods seen but the calculation must be correct for their values.

If there is no working, with incorrect u_3 and/or u_4 you will need to check if their answer implies a correct method using $6(35 + 40 + "28" + "33") + 35$

Attempts to use an AP/GP formula score M0

A1: 851 (Correct answer with no working scores both marks)