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20 12 Calculate the sum of the arithmetic series $4 + 10 + 16 + \dots + 1354$.

3

MA

Arithmetic series with $a = 4$, $d = 6$ and $l = T_n = 1354$. ✓

First, find the number of terms:

$$T_n = a + (n - 1)d$$

$$1354 = 4 + (n - 1)6$$

$$1354 = 4 + 6n - 6$$

$$1354 = 6n - 2$$

$$6n = 1356$$

$$n = 226 \quad \checkmark$$

$$\text{Now, } S_n = \frac{n}{2} [a + l]$$

$$S_{226} = \frac{226}{2} [4 + 1354]$$

$$= 153\,454 \quad \checkmark$$

State Mean:

2.57/3

HSC Marking Feedback

Students should:

- use the Reference Sheet to write down the formulae for arithmetic terms and sums
- show substitution into formulae
- identify a and d
- find how many terms there were in the series using the last given term
- use the formula to find the sum of an arithmetic series.

In better responses, students were able to:

- use the Reference Sheet to obtain the correct formulae for arithmetic series
- identify the value of a and d
- use the n th term formula to find the number of terms in the series
- use one of the sum formulae of an arithmetic series to find the sum
- use the Reference Sheet to obtain the correct formulae for arithmetic series.

Areas for students to improve include:

- showing how to find the value of n using the first term, common difference and last term
- understanding that n needs to be an integer, greater than 4
- using general algebra skills in factorising and solving equations
- using the calculator correctly for brackets and fractions.

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