# Higher Check In - 6.06 Sequences

1. Write ,  and  for the sequence generated by  if  and .
2. Complete the term-to-term rule in subscript notation for the sequence 3, 8, 18, 38, 78.



1. Write down the first five terms of the sequence whose formula for the *n*th term is.
2. Find the *n*th term of this sequence.



1. Write down the formula for the *n*th term of this quadratic sequence.

12, 24, 40, 60, ......

1. The position-to-term rule forasequence is . Huda says that 82 is a number in the sequence. Explain whether Huda is correct.
2. Louis states that the position-to-term rule for the sequence 4, 15, 26, 37, 48, 59, ... is . Is he correct? Explain your answer.
3. Show that the sequences whose position-to-term rules are  and have a term that is both equal in value and in the same position of the sequence.
4. A culture of bacteria doubles every 2 hours. If there are 300 bacteria at the beginning, how many bacteria will there be after 18 hours?
5. Laura is not well and is given some medication from her doctor. The doctor recommends that she takes 200 mg of her medication on the first day, and then decrease the dosage by one half each day for one week.

Find the position-to-term rule for this sequence and use it to calculate the amount of medication Laura will take on the 7th day. Write your answer to the nearest milligram.

**Extension**

The sum of 8 consecutive even numbers is 280. What are the 1st and 3rd terms in the sequence?

## Answers

1. 2, 3, 5
2. 
3. 4, 0, -2, -2, 0
4. 
5. 
6. Huda is incorrect. Solving  does not give a whole number answer so 82 cannot be in the sequence.
7. No, he is not correct. The formula is for a quadratic sequence, but the sequence increases by 11 each time so it is a linear sequence.
8. Equating  and solving  gives  or . Disregarding the negative solution, the equivalent term is in 5th place and has a value of 250.
9. , 
10. , 

The answer is 3 mg (to the nearest mg).

**Extension**

28 and 32

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| **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |  | **Assessment Objective** | **Qu.** | **Topic** | **R** | **A** | **G** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| AO1 | 1 | Generate a sequence from a term-to-term rule given in subscript notation |  |  |  |  | AO1 | 1 | Generate a sequence from a term-to-term rule given in subscript notation |  |  |  |
| AO1 | 2 | Write a term-to-term rule in subscript notation |  |  |  |  | AO1 | 2 | Write a term-to-term rule in subscript notation |  |  |  |
| AO1 | 3 | Generate a sequence from a position-to-term rule given in subscript notation |  |  |  |  | AO1 | 3 | Generate a sequence from a position-to-term rule given in subscript notation |  |  |  |
| AO1 | 4 | Generate and find *n*th terms of sequences that are not linear, quadratic or geometric |  |  |  |  | AO1 | 4 | Generate and find *n*th terms of sequences that are not linear, quadratic or geometric |  |  |  |
| AO1 | 5 | Find a formula for the *n*th term of a quadratic sequence |  |  |  |  | AO1 | 5 | Find a formula for the *n*th term of a quadratic sequence |  |  |  |
| AO2 | 6 | Use a formula for the *n*th term to locate the position of a term in a sequence |  |  |  |  | AO2 | 6 | Use a formula for the *n*th term to locate the position of a term in a sequence |  |  |  |
| AO2 | 7 | Recognise the difference between a linear and a quadratic sequence |  |  |  |  | AO2 | 7 | Recognise the difference between a linear and a quadratic sequence |  |  |  |
| AO2 | 8 | Use a formula for the *n*th term to locate the position of a term in a sequence |  |  |  |  | AO2 | 8 | Use a formula for the *n*th term to locate the position of a term in a sequence |  |  |  |
| AO3 | 9 | Solve a word problem using a formula for the *n*th term |  |  |  |  | AO3 | 9 | Solve a word problem using a formula for the *n*th term |  |  |  |
| AO3 | 10 | Solve a word problem using a formula for the *n*th term |  |  |  |  | AO3 | 10 | Solve a word problem using a formula for the *n*th term |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
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