

Arithmetic Sequences

Printable teaching and practice sheet

Chapter 2 | Module 6 | Student Book pages 40-56 | Suggested time: 50 minutes | 20 marks



Name: _____ Class: _____ Date: _____

Learning goals

- Explain and apply general term with valid conditions and clear reasoning.
- Explain and apply common difference with valid conditions and clear reasoning.
- Explain and apply finding parameters with valid conditions and clear reasoning.

Quick reference

General term	An arithmetic sequence has $a_n = a_1 + (n-1)d$.
Common difference	The common difference is $a_{n+1} - a_n$ and is constant.
Finding parameters	Two term conditions can determine the first term and common difference.

Worked example

An arithmetic sequence has $a_1=6$ and common difference 4. Find a_{11} . Worked solution:
 $a_{11} = a_1 + (11-1)d = 6 + 10 \cdot 4 = 46$.

Graduated practice

Answer without viewing the key. Show complete working for short-response questions.

1. An arithmetic sequence has first term 7 and common difference 5. Find a_{12} . [1 marks]

- A) 57
B) 60
C) 62
D) 67

2. For the sequence 18, 13, 8, 3, ... what is the common difference? [1 marks]

- A) 5
B) -5
C) -3
D) 31

3. In an arithmetic sequence, $a_4=17$ and $a_9=42$. Find a_1 and d . [1 marks]

- A) $a_1=2$, $d=5$
B) $a_1=5$, $d=2$
C) $a_1=7$, $d=5$
D) $a_1=2$, $d=25$

4. An arithmetic sequence has first term 4 and common difference 3. Find the sum of its first 10 terms. [1 marks]

- A) 155
B) 165
C) 175
D) 185

5. Find the sum of all integers from 21 to 50 inclusive. [1 marks]

- A) 1035
B) 1050
C) 1065
D) 1080

6. If $a_n=20-3(n-1)$, for which n is S_n greatest? [1 marks]

- A) $n=6$
B) $n=7$
C) $n=8$
D) $n=20$

7. True or false: the general term of an arithmetic sequence is $a_n=a_1+nd$. [1 marks]

☐ True ☐ False

8. True or false: if the difference between each term and its predecessor is constant, the sequence is arithmetic. [1 marks]

☐ True ☐ False

9. In an arithmetic sequence, $a_5=18$ and $a_{12}=46$. Find a_1 and d , showing your method. [3 marks]

10. Find the sum of the first 15 terms of 8, 12, 16, ... Write the formula and substitution. [3 marks]

11. Find the sum of the multiples of 6 from 24 to 120 inclusive. Show how you counted the terms. [3 marks]

12. If $a_n = 32 - 5(n-1)$, find the greatest partial sum S_n and the value of n where it occurs. Justify your answer. [3 marks]

Challenge and review

1. Derive the sum of the first n terms of an arithmetic sequence by writing the sum forwards and backwards.

2. A student saves EGP 40 in week 1 and increases the amount by EGP 15 each week. Find the week-12 amount and the total saved over 12 weeks.

3. Error analysis: a student says there are $50-21=29$ integers from 21 to 50 inclusive. Explain and correct the error.

Follow-up plan

Below 14/20: revisit the difference between a_n and S_n and inclusive term counting, then retry Questions 3-6 and 9-12. At 14 or above: continue to the online module challenge.