

Sequences - n th Terms and Limiting Values

For AQA Level 2 Certificate in Further Mathematics (8365)

Name _____

Total marks: **34**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator.

- 1** Here are the first four terms of a linear sequence.

13.6 11.2 8.8 6.4

Work out an expression for the n th term.

[2 marks]

Answer _____

- 2** Here are the first four terms of a linear sequence.

247 240 233 226

- (a) Work out which term of the sequence has the value -145
You must show your working.

[2 marks]

Answer _____

- (b) How many terms of the sequence are positive?

[2 marks]

Answer _____

- 3** Here are the first three terms of a linear sequence.

$$5p + 2q \qquad 7p - q \qquad 9p - 4q$$

- (a) Work out an expression for the n th term.
Give your answer in terms of n , p and q .

[2 marks]

Answer _____

- (b) The 1st term of the sequence is 31 and the 20th term is 50
Work out the values of p and q .

[3 marks]

$p =$ _____ $q =$ _____

- 4** Here are the first five terms of a quadratic sequence.

9 13 13 9 1

- (a) Work out an expression for the n th term.

[3 marks]

Answer _____

- (b) Which term of the sequence has the value -131 ?
You must show your working.

[2 marks]

Answer _____

- 5** Here are the first five terms of a quadratic sequence.

3 7.5 13 19.5 27

Work out an expression for the n th term.

[3 marks]

Answer _____

6 The n th term of a sequence is $\frac{4n - 3}{2n + 5}$

(a) Show that the 10th term is $\frac{26}{75}$ more than the 5th term.

[2 marks]

(b) Which term of the sequence has the value $\frac{5}{3}$?

[2 marks]

Answer _____

(c) Write down the limiting value of the sequence as $n \rightarrow \infty$

[1 mark]

Answer _____

- 7 The n th term of a quadratic sequence is $an^2 + bn + 7$, where a and b are constants.
The 2nd term of the sequence is 1
The 5th term of the sequence is -23

(a) Work out the values of a and b .

[3 marks]

$a =$ _____ $b =$ _____

- (b) Which term of the sequence has the value -83 ?
Do not use trial and improvement.

[2 marks]

Answer _____

- 8 The n th term of a sequence is $\frac{an + 3}{n + b}$, where a and b are constants.
The limiting value of the sequence as $n \rightarrow \infty$ is 4

(a) Write down the value of a .

[1 mark]

$a =$ _____

(b) The 3rd term of the sequence is 1.875
Work out the value of b .

[2 marks]

$b =$ _____

(c) Work out the position of the first term of the sequence that is greater than 3.8
You must show your working.

[2 marks]

Answer _____