Name:

Level 2 Further Maths

Sequences

Corbettmαths

Ensure you have: Pencil or pen

Guidance

1. Read each question carefully before you begin answering it.
2. Check your answers seem right.
3. Always show your workings

Revision for this topic

www.corbettmaths.com/more/further-maths/

1. The nth term of a sequence is $\frac{6n-3}{10n}$

(a) Which term in the sequence is equal to 0.58?

$\frac{6n-3}{10n} = 0.58$

$6n - 3 = 5.8n$

$0.2n - 3 = 0$

$0.2n = 3$

15

(2)

(b) Work out the difference between the 5th and 12th terms

5th term = 0.54

12th term = 0.575

0.035

(2)

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2. Here is a linear sequence

1924 1849 1774 ... ...

How many terms in the sequence are positive?

$1999 - 75n > 0$

$1999 > 75n$

$26.65\dot{3} > n$

26

(2)

3. The first three terms in a sequence are

$$\frac{5}{9}, \frac{11}{14}, \frac{17}{19}, \ldots$$

Write down the nth term for the sequence

$\frac{6n-1}{5n+4}$

$\frac{6n+1}{5n+4}$

.....

(3)

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4. The nth term of a sequence is $\frac{2n+1}{3n-5}$

Write down the limiting value of the sequence $n \to \infty$

$\frac{2}{3}$

.....

(1)

5. The nth term of a sequence is $\frac{1-9n}{2n+4}$

Write down the limiting value of the sequence $n \to \infty$

$-\frac{9}{2}$

.....

(1)

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6. The nth term of a sequence is $\frac{240-8n}{70+4n}$

(a) Work out the term in the sequence that is equal to 0

$240 - 8n = 0$

$n = 30$

30th

.....

(1)

(b) Write down the limiting value of the sequence as $n \to \infty$

-2

.....

(1)

7. The nth term of a sequence is $\frac{3n}{8n+13}$

(a) Work out the position of the term that has a value of $\frac{1}{3}$

$\frac{3n}{8n+13} = \frac{1}{3}$

$8n + 13 = 9n$

$n = 13$

13th

.....

(2)

(b) Write down the limiting value of $\frac{3n}{8n+13}$ as $n \to \infty$

$\frac{3}{8}$

.....

(1)

$-5-2\sqrt{6}$

8. The first two term terms in a linear sequence are $5+3\sqrt{6}$ and $\sqrt{6}$

What is the fifth term in the sequence?

3rd term $-5-\sqrt{6}$

4th term $-10-3\sqrt{6}$

5th term $-15-5\sqrt{6}$

$-15-5\sqrt{6}$

(3)

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9. The first term of a sequence is $5-2a$

The term-to-term rule of the sequence is subtract 4a and then multiply by 2

The fourth term of the sequence is 58

Work out the second term of the sequence.

2nd term $10-12a$

3rd term $20-32a$

4th term $40-72a$

$40-72a=58$

$-72a=18$

$a=-\frac{1}{4}$

2nd term $10-12\times\left(-\frac{1}{4}\right)$

13

(4)

10. The nth term of sequence A is $\frac{n+2}{2n-3}$

The nth term of sequence B is $\frac{3n-14}{n+5}$

The qth term in sequence A is the same as the qth term in sequence B.

Work out the value of q

$$\frac{q+2}{2q-3} = \frac{3q-14}{q+5}$$

$$q^2+7q+10 = 6q^2-37q+42$$

$$0 = 5q^2-44q+32$$

$$0 = (q-8)(5q-4)$$

$q = 8$ or $q = \frac{4}{5}$ ×

8

(4)