

GCSE Exam Questions

Recurrence Relation | Algebra

GCSE Exam Questions: Recurrence Relation

1) (a) A sequence U_1 , U_2 , U_3 , U_4 , ... is given by the recurrence relation

$$U_{n+1} = 3U_n + 2$$

$$U_1 = 2$$

Find the value of U_2 , U_3 , U_4 and U_5 .

(4 marks)

2) A sequence is defined by the recurrence relation

$$U_{\rm n} = 0.9U_{\rm n-1} + 2$$

$$U_1 = 3$$

(a) Calculate the value of U_2 .

(2)

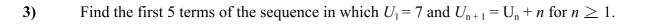
(b) What is the smallest value of *n* for which $U_n > 10$?

(3)

(5 marks)



GCSE Exam Questions: Recurrence Relation



(3 marks)



GCSE Exam Questions: Recurrence Relation Answers

	Question	Answer	Marks
1)	A sequence U_1 , U_2 , U_3 , U_4 , is given by the recurrence relation $U_{n+1} = 3U_n + 2$ $U_1 = 2$ Find the value of U_2 , U_3 , U_4 and U_5 .	$U_2 = 3(2) + 2 = 8$ $U_3 = 3(8) + 2 = 26$ $U_4 = 3(26) + 2 = 80$ $U_5 = 3(80) + 2 = 242$	(1) (1) (1) (1)
2) (a)	A sequence is defined by the recurrence relation $U_{\rm n}=0.9U_{\rm n-1}+2$ $U_{\rm 1}=3$ Calculate the value of $U_{\rm 2}$	(a) $(0.9 \times 3) + 2$ 4.7	(1) (1)
(b)	What is the smallest value of n for which $U_{\rm n} > 10$?	(b) $U_3 = 6.23$ $U_4 = 7.607$ $U_5 = 8.8463$ $U_6 = 9.96167$ $U_7 = 10.965503$	(1) (1) (1)
3)	Find the first 5 terms of the sequence in which $U_1 = 7$ and $U_{n+1} = U_n + n$ for $n \ge 1$.	$U_2 = 7 + 1 = 8$ $U_3 = 8 + 2 = 10$ $U_4 = 10 + 3 = 13$ $U_5 = 13 + 4 = 17$ $8, 10, 13, 17,$	(1) (1) (1)

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