Name: SOLUTIONS

GCSE (1 - 9) Quadratic Sequences	Solutions by Kenneth Stafford MATHS TUTOR ken@kennethstafford.co.uk

These questions are compiled from released Pearson Edexcel GCSE maths exam papers

They contain exam questions from up until the ***November 2023*** exam series

More recent exam papers do exist but are withheld for mock exams

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1

Here are the first five terms of a sequence.

4 11 22 37 56

Find an expression, in terms of n, for the nth term of this sequence.

$a + b + c = 4$

$3a + b = 7$

$2a = 4$

$a = 2$

$3a + b = 7$

$6 + b = 7$

$b = 1$

$a + b + c = 4$

$2 + 1 + c = 4$

$c = 1$

11 22 37 56

11 15 19

4 4 4

$an^2 + bn + c$

$2n^2 + 1n + 1$

(Total for Question 22 is 3 marks)

[Edexcel, GCSE, Summer 2017, Paper 2H, Q22]

2

The nth term of a sequence is given by $an^2 + bn$ where a and b are integers.

The 2nd term of the sequence is –2
The 4th term of the sequence is 12

(a) Find the 6th term of the sequence.

$a(2)^2 + b(2) = -2$ (A) $4a + 2b = -2$

$a(4)^2 + b(4) = 12$ (B) $16a + 4b = 12$

(B) $16a + 4b = 12$

2 × (A) $8a + 4b = -4$

$8a = 16$

$a = 2$

$b = -5$

$2(6)^2 + -5(6)$

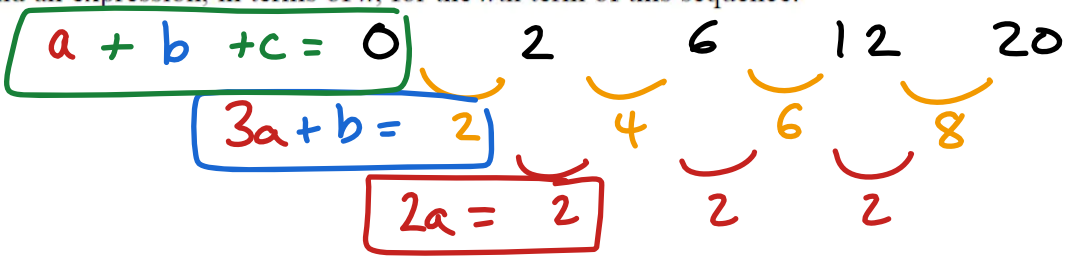
$= 72 - 30 = 42$

(4)

Here are the first five terms of a different quadratic sequence.

0 2 6 12 20

(b) Find an expression, in terms of n, for the nth term of this sequence.



$2a = 2$

$a = 1$

$3a + b = 2$

$3 + b = 2$

$b = -1$

$a + b + c = 0$

$1 + -1 + c = 0$

$c = 0$

$1n^2 - 1n + 0$

(2)

$n^2 - n$

(Total for Question 16 is 6 marks)

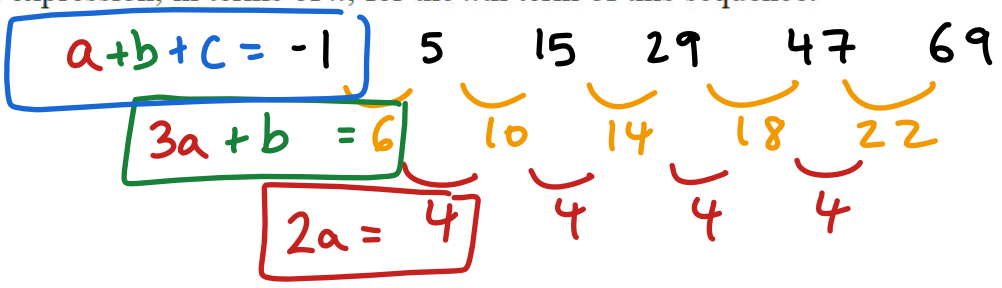
[Edexcel, GCSE, Summer 2018, Paper 3H, Q16]

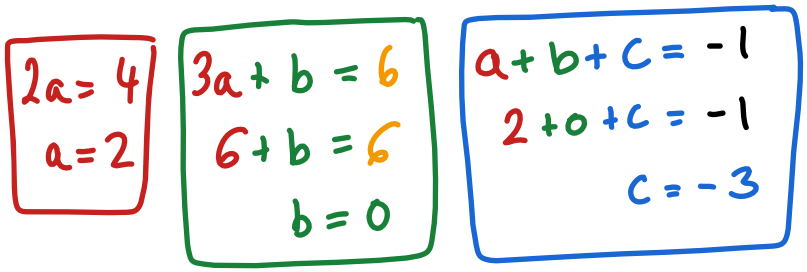
3

Here are the first six terms of a quadratic sequence.

−1 5 15 29 47 69

Find an expression, in terms of n, for the nth term of this sequence.





$2n^2 - 3$

(Total for Question 16 is 3 marks)

[Edexcel, GCSE, Summer 2019, Paper 3H, Q16]

4

The nth term of a sequence is $2n^2 - 1$

The nth term of a different sequence is $40 - n^2$

Show that there is only one number that is in both of these sequences.

$2n^2 - 1$

$2(1)^2 - 1 = 1$
$2(2)^2 - 1 = 7$
$2(3)^2 - 1 = 17$
$2(4)^2 - 1 = 31$
$2(5)^2 - 1 = 49$
$2(6)^2 - 1 = 71$

$40 - n^2$

$40 - (1)^2 = 39$
$40 - (2)^2 = 36$
$40 - (3)^2 = 31$
$40 - (4)^2 = 24$
$40 - (5)^2 = 15$
$40 - (6)^2 = 4$
$40 - (7)^2 = -9$

31 is the only term in both

(Total for Question 6 is 3 marks)

[Edexcel, GCSE, Autumn 2019, Paper 2H, Q06]

5

Here are the first five terms of a sequence.

−1 0 3 8 15

Find an expression, in terms of n, for the nth term of this sequence.

$a+b+c=-1$

$3a+b=1$

$2a=2$

$a=1$

$3+b=1$

$b=-2$

$1+-2+c=-1$

$c=0$

n^2-2n

(Total for Question 20 is 2 marks)

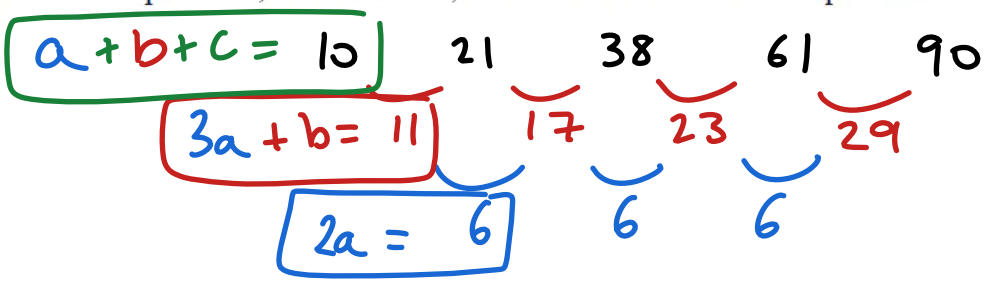
[Edexcel, GCSE, Autumn 2019, Paper 3H, Q20]

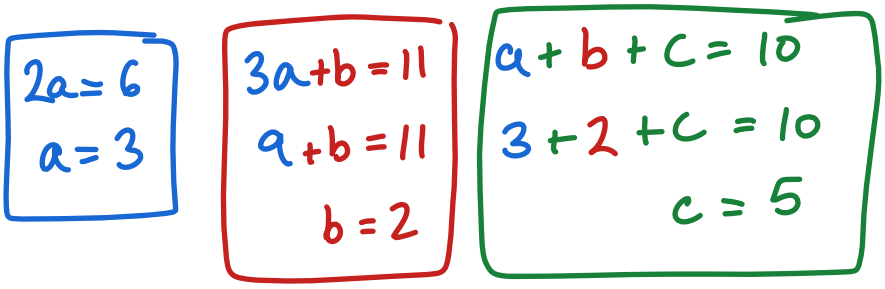
6

Here are the first five terms of a quadratic sequence.

10 21 38 61 90

Find an expression, in terms of n, for the nth term of this sequence.





$3n^2 + 2n + 5$

(Total for Question 16 is 3 marks)

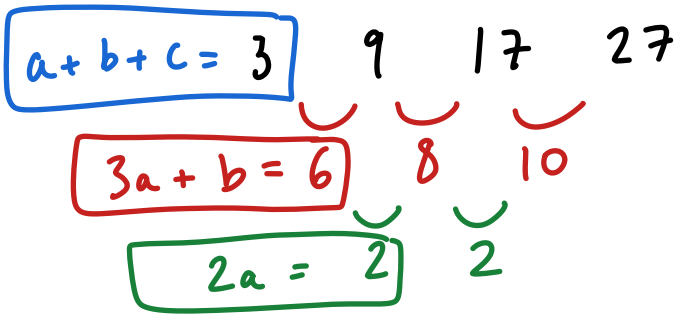
[Edexcel, GCSE, Autumn 2020, Paper 2H, Q16]

7

Here are the first four terms of a quadratic sequence.

3 9 17 27

Find an expression, in terms of n, for the nth term of this sequence.



$2a = 2$
$a = 1$

$3a + b = 6$
$3 + b = 6$
$b = 3$

$a + b + c = 3$
$1 + 3 + c = 3$
$c = -1$

$1n^2 + 3n - 1$

(Total for Question 15 is 3 marks)

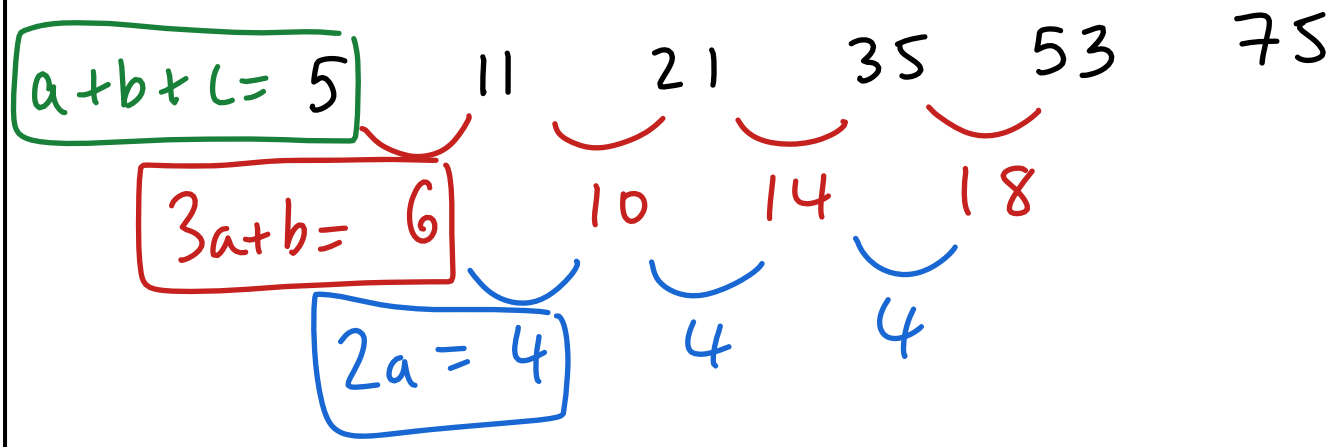
[Edexcel, GCSE, Summer 2023, Paper 2H, Q15]

8

Here are the first six terms of a quadratic sequence.

5	11	21	35	53	75

Find an expression, in terms of n, for the nth term of this sequence.



$2a = 4$ $\quad 3a + b = 6$ $\quad a + b + c = 5$

$a = 2$ $\quad 6 + b = 6$ $\quad 2 + 0 + c = 5$

$b = 0$ $\quad c = 3$

$2n^2 + 3$

(Total for Question 14 is 2 marks)

[Edexcel, GCSE, November 2023, Paper 3H, Q14]