

(2 marks)

1. A quadratic sequence is given by  $U_n = n^2 + 2n - 4$ Write down the first six terms in the sequence.

$$\begin{aligned} 1(Q = (1)^{L} + 1(1)^{2} - 4 & \qquad (Q = (Q)^{L} + 1(Q)^{2} - 4 \\ &= -1 & = 10 \\ 1+Q = (L)^{L} + 1(L)^{2} - 4 & \qquad (Q = (Q)^{L} + 1(Q)^{2} - 4 \\ &= -1 & = 3( \\ 3Q = (Q)^{L} + 1(Q)^{2} - 4 & \qquad (Q = Q)^{L} + 1(Q)^{2} - 4 \\ &= -1 & \qquad (Q = Q)^{L} + 1(Q = Q)^{L} + 1(Q)^{2} - 4 \\ &= -1 & \qquad (Q = Q)^{L} + 1(Q = Q)^{L} + 1(Q$$

3. The nth term of a sequence is  $3n^2 + 2n - 2$ Work out the 10th term of the sequence

(2 marks)

$$1000 = 3(10)^{L} + 2(10) - L$$
  
=  $3(100) + 20 - L$   
=  $318$ 





5. Here are the first 5 terms of a quadratic sequence 5 9 17 29 45 Find an expression, in terms of n, for the nth term of this sequence. (3 marks)  $a + b + c = \int_{a} \int_{a$ 

$$30+b = 4 \qquad 8 \qquad 12 \qquad 16 \qquad 2n^2 - 2n + 5$$

$$2a = 4 \qquad 4 \qquad 4 \qquad = 5$$

$$3a + b = 4 \qquad a + b + c = 5$$

$$3(2) + b = 4 \qquad 2 - 2 + c = 5$$

$$b = -2 \qquad c = 5$$



6. Here are the first 6 terms of a quadratic sequence 22 66 2 9 41 97 Find an expression, in terms of n, for the nth term of this sequence. (3 marks) 22 ٩٦ 66 41 axbxc= 2 9 ant+bn+c 7 13 19 25 3a+6 = 3( ` ` ``. م م ع م 3n2-2n+1 3a+b=7 a+b+c=2 3(3)+b=7 b-2+c=2 9+b=7 1+c=26 = -1 = 1

7. Here are the first 5 terms of a quadratic sequence

-2 18 11 -21 -46 .... (a) Find an expression, in terms of n, for the nth term of this sequence. (3 marks) atbic: 18 11 -2 - 24 ant+bn+c  $= 3n^{2} + 2n + 19$ 3a+b = -7 - -13 - -193a+b=-7 a+b+c=18 3(-3) + 6 = -7 - 3 + 2 + c = 18-9 + 1 + c = 18 -9 +6 =-7 C = 19 6 = 2

(b) Calculate the 10th term in the sequence.

(1 mark)



8. A quadratic sequence starts:  
-8 2, 16 34...  
a) Show that the nth term is 
$$2n^2 + 4n - 14$$
  
 $a + b + c = -8$   
 $b = 4$   
b) Hence find the term that has the value 112.  
 $2n^2 + 4n - 14 = 112$   
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 $n^2 + 4n - 14 = 112$   
 $2n^2 + 4n - 14 = 112$   
 $n = -9$   
 $n^2 + 2n - 1 = 56$   
 $n = -9$   
 $n^2 + 2n - 2$   
 $n^2 + 4n - 14 = 112$   
 $n = -9$   
 $n = -1$   
 $n = -$ 

b) Calculate the 10th term in the sequence.

(1 mark)

$$0.5(10)^{L} - 0.5(10) - 1 - 1$$
  
 $50 - 5 - 2 = 43$ 



(3 marks)

10. a) Calculate the formula for the nth term of the following sequence: a+b+c = 19 15 9 1.... an+bn+c (3 marks) 3a+b = -4 -4 -1n+24 3a+b = -4 -4b+c = 19 3(-1)+b = -4 -1-1+c = 19 -3+b = 4 -2+c = 19b) Calculate the 10th term in the sequence. (1 mark)

#### b) Calculate the 10th term in the sequence.

$$(0)^{2} - (0) + 21$$
  
 $(0)^{2} - (0) + 21$   
 $100 - 10 + 21 = -89$ 

11. The nth term of a sequence is 
$$n^2 + 2n + 1$$

Two consecutive terms in the sequence have a difference of 13. Work out the two terms.

$$40 = (4)^{2} + 2(4) + 1$$
  
= 25  
$$10 = (5)^{2} + 2(5) + 1$$
  
= 36  
$$50 = (6)^{2} + 1(6) + 1$$
  
= 49



- 12. Here are some patterns made with square tiles.
  - (a) Write an expression, in terms of n, for the number of tiles needed to make the nth pattern in this sequence. (3 marks)
  - (b) Joe says that one pattern in the sequence is made from exactly 80 tiles. Is Joe correct? Give a reason for your answer. (1 mark)

