

Examples



Workout

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Question 1: Find the next two terms for each quadratic sequence

- (a) 4, 6, 10, 16, 24 ... ..      (b) 1, 2, 4, 7, 11 ... ..      (c) 2, 5, 10, 17, 26 ... ..  
(d) 3, 9, 19, 33, 51 ... ..      (e) 50, 48, 44, 38, 30 ... ..      (f) 3, 14, 29, 48, 71 ... ..

Question 2: List the first 5 terms of the sequences with  $n^{\text{th}}$  term:

- (a)  $n^2$                       (b)  $n^2 + 1$                       (c)  $n^2 + 4$                       (d)  $n^2 - 2$                       (e)  $2n^2$   
(f)  $5n^2$                       (g)  $\frac{1}{2}n^2$                       (h)  $\frac{1}{4}n^2$                       (i)  $3n^2 + 10$                       (j)  $\frac{3}{5}n^2$

Question 3: The quadratic  $n^{\text{th}}$  term of the sequence below is  $n^2$   
1, 4, 9, 16, 25, 36, 49 ...

Find the  $n^{\text{th}}$  term of each of these sequences

- (a) 4, 7, 12, 19, 28, 39, 52 ...      (b) 51, 54, 59, 66, 75, 86, 99 ...      (c) -5, -2, 3, 10, 19, 30...  
(d) 3, 12, 27, 48, 75, 108 ...      (e) 20, 80, 180, 320, 500, 720 ...      (f) 0.2, 0.8, 1.8, 3.2, 5 ...  
(g) 3, 9, 19, 33, 51, 73, 99 ...      (h) 2.5, 4, 6.5, 10, 14.5, 20 ...

Question 4: For each  $n^{\text{th}}$  term, work out the first five terms of the sequence.

- (a)  $n^2 + n$                       (b)  $n^2 + 2n$                       (c)  $n^2 - n$                       (d)  $n^2 - 3n$   
(e)  $n^2 + n + 2$                       (f)  $n^2 - 2n + 5$                       (g)  $n^2 + 4n - 10$                       (h)  $2n^2 + n$   
(i)  $3n^2 - n + 6$                       (j)  $10n^2 + 5n - 7$

Question 5: For each  $n^{\text{th}}$  term, work out the first five terms of the sequence.

- (a)  $-n^2$                       (b)  $-2n^2$                       (c)  $-4n^2 + 2$                       (d)  $-n^2 + 3n$   
(e)  $50 - n^2$                       (f)  $6n - n^2$                       (g)  $-n^2 - 7n - 2$

Question 6: For each  $n^{\text{th}}$  term, work out the first five terms of the sequence.

- (a)  $n(n + 1)$       (b)  $n(n + 3)$       (c)  $(n + 1)(n + 5)$       (d)  $n(n - 2)$   
(e)  $(n - 3)(n + 1)$       (f)  $(n - 8)(n - 3)$

Question 7: Work out the  $n^{\text{th}}$  term for each quadratic sequence

- (a) 7, 12, 19, 28, 39 ...      (b) 7, 16, 31, 52, 79 ...      (c) 6, 13, 24, 39, 58 ...  
(d) 3, 13, 27, 45, 67 ...      (e) 9, 20, 35, 54, 77 ...      (f) 9, 24, 45, 72, 105 ...  
(g) -6, -1, 6, 15, 26 ...      (h) -5, -4, -1, 4, 11 ...      (i) 7, 10, 17, 28, 43 ...  
(j) 2.5, 5, 8.5, 13, 18.5 ...      (k) -0.5, 1, 4.5, 10, 17.5 ...

Question 8: Calculate the 10<sup>th</sup> term of each sequence in question 7

Question 9: Work out the  $n^{\text{th}}$  term for each quadratic sequence

- (a) 3, 1, -3, -9, -17...      (b) -4, -12, -24, -40, -60 ...      (c) 6, 5, 2, -3, -10 ...  
(d) 100, 96, 90, 82, 72 ...      (e) -17, -30, -49, -74, -105 ...      (f) 6, 5.5, 4.5, 3, 1 ...

Question 10: Calculate the 10<sup>th</sup> term of each sequence in question 9

Question 11: A sequence has an  $n^{\text{th}}$  term of  $n^2 + n - 20$   
Work out which term in the sequence has a value of 52.

Question 12: A sequence has an  $n^{\text{th}}$  term of  $n^2 + 2n - 5$   
Work out which term in the sequence has a value of 58.

Question 13: A sequence has an  $n^{\text{th}}$  term of  $n^2 - 6n + 7$   
Work out which term in the sequence has a value of 23.

### Apply

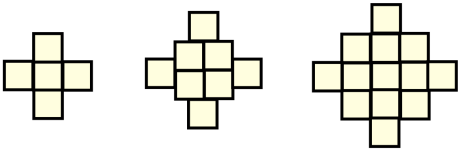
Question 1: The first 5 terms of a quadratic sequence are: 4, 10, 18, 28, 40  
Work out the difference between the 10<sup>th</sup> and 20<sup>th</sup> terms.

## Quadratic n<sup>th</sup> Term

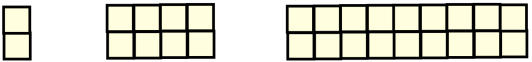
Video 388 on [www.corbettmaths.com](http://www.corbettmaths.com)

Question 2: Below are patterns of tiles.  
The number of tiles in each form quadratic sequences.  
Find the number of tiles in pattern n for each.

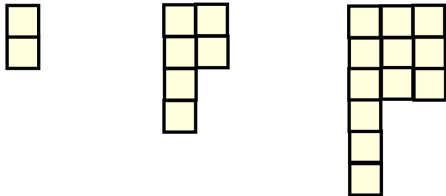
(a) Pattern 1 Pattern 2 Pattern 3



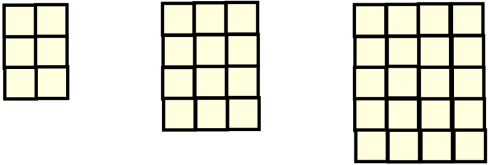
(b) Pattern 1 Pattern 2 Pattern 3



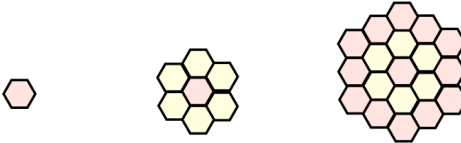
(c) Pattern 1 Pattern 2 Pattern 3



(d) Pattern 1 Pattern 2 Pattern 3



Question 3: Here is a pattern made from tiles.  
How many tiles are needed to make Pattern 20?



Pattern 1 Pattern 2 Pattern 3

Question 4: The first 4 terms of a sequence are: 400, 390, 375, 355 ...  
Which term is the first to be negative?

Question 5: The n<sup>th</sup> term of a quadratic sequence is  $n^2 + 4n$   
Two consecutive terms have a difference of 25.  
Work out the two terms.

Question 6: Prove every term in the sequence  $n^2 - 8n + 21$  is positive

Answers



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