

## Problems with Arithmetic Sequences

- (a) The  $n$ th term of a sequence is  $6n - 1$ . Find an expression for the  $(n + 1)$ <sup>th</sup> term of the sequence.
- (b) The  $n$ th term of a sequence is  $12 - 5n$ . Find an expression for the  $(n + 2)$ <sup>th</sup> term of the sequence.
- (c) The  $n$ th term of a sequence is  $4n - 9$ . Find an expression for the  $(2n)$ <sup>th</sup> term of the sequence.

- (a) An arithmetic sequence starts  $2a, 2a - b, 2a - 2b, 2a - 3b, \dots$ . Find expressions for (i) the 6<sup>th</sup> term and (ii) the  $n$ th term of the sequence in terms of  $a$  and  $b$ .
- (b) An arithmetic sequence has a 2<sup>nd</sup> term  $7c$  and a 5<sup>th</sup> term  $10c - 3d$ . Find expressions in terms of  $c$  and  $d$  for (i) the 1<sup>st</sup> term and (ii) the  $n$ th term of the sequence.

- Karen is training for a marathon. In week 1 she runs 5 miles. She increases the distance she runs by 2 miles each week.
- (i) In which week does Karen run 17 miles?  
(ii) How many miles does she run in the  $n$ th week?

- Alisha is donating money to charity. On the first day, she gives 25p to charity. On the second day she gives 40p, and so on in an arithmetic sequence.
- (i) How much money does Alisha donate on the 5<sup>th</sup> day?  
(ii) How much money does she donate on the  $n$ th day?  
(iii) How much more does she donate on day 28 compared to day 14?

- Sequence A starts 23, 27, 31, 35, ...  
Sequence B starts 8, 13, 18, 23, ...  
For what value of  $n$  does the  $n$ th term of sequence B first exceed the  $n$ th term of sequence A.

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