

Sequences – Series – Patterns

chapter

4

Section 4.1 Sequences

Sequence 2, 4, 6, 8, 10, ...
 Series 2 + 4 + 6 + 8 + 10 + ...

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Example 1

Write down the first four terms of each of the following sequences:

(i) $T_n = n^2 + n$
 (u_n)

(ii) $T_n = 2^n - 3n$
 (u_n)

(i)
 $x^2 + x$
 QUADRATIC
 alternative notation
 "T_n" or "u_n"

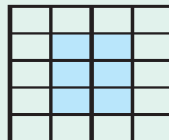
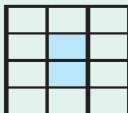
$T_n = n^2 + n$
 $T_1 = 1^2 + 1 = 2$
 $T_2 = 2^2 + 2 = 6$
 $T_3 = 3^2 + 3 = 12$
 $T_4 = 4^2 + 4 = 20$
 30
 Quadratic
 2nd diff.
 is const.

$T_3 = ?$

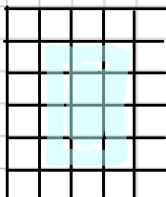
$T_n = 2^n - 3n$
 $T_3 = 2^3 - 3(3) = 8 - 9 = -1$

Example 2

The following rectangular patterns are made from two sets of coloured tiles.



- Draw the next two patterns of tiles.
- Write a number sequence for the blue tiles used in each of these patterns.
- Write a number sequence for the total number of tiles used in each of these patterns.
- Write a number sequence for the white tiles used in each of these patterns.
- Write out the next 3 terms in each sequence found in (ii), (iii), (iv).



Blue tiles : 0, 2, 6, 12, 20 ...

White tiles : 6, 10, 14, 18, 22 ...

5. If $T_n = 4n - 3$, find T_1, T_5, T_{10} .

$$T_1 = 4(1) - 3 = 4 - 3 = 1$$

$$T_5 = 4(5) - 3 = 20 - 3 = 17$$

$$T_{10} = 4(10) - 3 = 40 - 3 = 37$$