Sequences

i. For each of the following n^{th} terms, write out the value of u_1, u_2, u_3 and u_{20}:

- $u_n = 2n + 1$
- $u_n = 4n + 5$
- $u_n = 10n - 4$
- $u_n = \dfrac{2000}{2n}$
- $u_n = \dfrac{n}{3}$
- $u_n = n^2 - 20$
- $u_n = 2n^2$
- $u_n = 1000 - n$
- $u_n = \dfrac{25n}{10}$
- $u_n = (-1)^n$

ii. A sequence is generated by the formula $u_n = an + b$. Given that $u_3 = 5$ and $u_5 = 15$, find the values of a and b.

iii. A sequence is given by the formula $u_n = (4n - 2)^2$. Given that for some k, $u_k = 100$, find the value of k.

iv. Write out the value of u_2 and u_3 for each of the following recursively defined sequences:

- $u_1 = 1$,
  $u_{n+1} = 3(u_n) + 5$
- $u_1 = 4$,
  $u_{n+1} = 2(u_n) - 4$
- $u_1 = 10$,
  $u_{n+1} = u_n + 5$
- $u_1 = 6$,
  $u_{n+1} = 5 - u_n$
- $u_1 = 4$,
  $u_{n+1} = (u_n)^2 - 10$
- $u_1 = 19$,
  $u_{n+1} = 20 - 2(u_n)$
- $u_1 = 20$,
  $u_{n+1} = \dfrac{u_n}{2} + 4$
- $u_1 = 15$,
  $u_{n+1} = \dfrac{1}{u_n}$

v. Given that $u_1 = 1, u_2 = 2$ and $u_{n+1} = u_n + u_{n-1}$, find u_3 and u_4.

vi. A sequence is recursively defined by $u_{n+1} = 3(u_n) - 2$. The 5^{th} term of the sequence is 49. Find u_4 and u_3.

