3G Recurrence Relationships

1. Find the first four terms of the following sequences:

   a) $u_{n+1} = u_n + 4, \ u_1 = 7$

   b) $u_{n+1} = u_n + 4, \ u_1 = 5$

2. Find the first five terms generated by the following sequence:

$u_{n+1} = 2u_n + 3, \ u_1 = 2$

3. A sequence $a_1, \ a_2, \ a_3,\ldots$ is defined by:

$$a_1 = p$$

$a_{n+1} = (a_n)^2 - 1, n \geq 1$

where $p < 0$

a) Show that $a_3 = p^4 - 2p^2$

b) Given that $a_2 = 0$, find the value of p

c) Find:

$$\sum_{r=1}^{200} a_r$$

d) Find the value of a_{199}