Homework Questions 3 – Recursive Formula

1. Find the next 3 terms of the following sequences given both the first term and the recursive formula.

a) $U_1 = 5 \quad U_{n+1} = 3U_n$

| 15, 45, 135 |

b) $U_1 = -3 \quad U_{n+1} = 2U_n$

| -6, -12, -24 |

c) $U_1 = 2 \quad U_{n+1} = 3U_n - 4$

| -24, -76, -232 |

d) $U_1 = 16 \quad U_{n+1} = \dfrac{U_n}{4}$

| 4, 1, 0.25 |

2. By writing down the first 4 terms or otherwise, find the recursive formula that defines the following sequence.
   a) $U_n = 2n - 1$

| $U_{n+1} = U_n + 2$ |

   b) $U_n = 3n - 2$

| $U_{n+1} = U_n + 3$ |

3. Find the next 4 terms of these recursively defined sequences
   a) $U_{n+1} = U_n - U_{n-1}$ when $U_1 = 6$ and $U_2 = 2$

| 6, 2, 8, 10, 18, 28 |

   b) $U_{n+1} = 3U_n + 2U_{n-1}$ when $U_1 = 1$ and $U_2 = -3$

| 1, -3, -7, -27, -95, -339 |

   c) $U_{n+1} = 5U_n - 11$ when $U_1 = 3$

| 3, 4, 9, 34, 159 |

4. Write down the first 3 terms of the sequence defined by
      $U_{n+1} = 12 - U_n$ when $U_1 = 10$

| 10, 2, 10 |