Quiz # 19   Name: _____Key_____

You must show your work to get full credit.

1. Find the first five terms of the sequence defined by
$$a_k = 2a_{k-1} + k \quad \text{for} \quad k \geq 2$$

and $a_1 = 1$.

$a_1 =$ _____1_____

$a_1 = 1$

$a_2 = 2(1) + 2 = 4$ $a_2 =$ _____4_____

$a_3 = 2(4) + 3 = 11$ $a_3 =$ _____11_____

$a_4 = 2(11) + 4 = 26$ $a_4 =$ _____26_____

$a_5 = 2(26) + 5 = 57$ $a_5 =$ _____57_____

2. Let $t_n = 2 + n$ for all integers $n \geq 0$. Show this sequence satisfies
$$t_k = 2t_{k-1} - t_{k-2}.$$

$2t_{k-1} - t_{k-2} = 2(2 + (k-1)) - (2 + (k-2))$

$= 4 + 2k - 2 + 2 - k + 2)$

$= 2k - k + 4 - 2$

$= k + 2$ done

$= t_k$