Homework3 q3

Please use Substitution method to find Big-O of this recursion . .

$$T(n) = 0 \quad \text{if } n = 1$$
$$T(n) = T(n-1) + n - 1 \quad \text{if } n \geq 2$$

T(n) = T(n-1) + n - 1

= [T(n-2) + (n-1) - 1] + (n-1) - 1

= T(n-2) + 2(n-1) - 2

= T(n-3) + 3(n-1) - 3

= T(n-4) + 4(n-1) – 4

= T(n-5) + 5(n-1) – 5

= ..

= T(1) + n(n-1) - (1 + 2 + 3 + ... + (n-1))

T(1) + n(n-1) - (1 + 2 + 3 + ... + (n-1))

= 0 + n(n-1) - (n(n-1))/2

= n(n-1) - (n(n-1))/2

= (2n(n-1) - n(n-1))/2

= (n^2 - n)/2

Big O=$O(n^2)$