solving for $a_n$

1) $a_n = a_{n-1} + 6(n-1)$

2) $= a_{n-2} + 6(n-1) + 6(n-2)$

3) $= a_{n-3} + 6(n-1) + 6(n-2) + 6(n-3)$

$= \dots$

4) $= a_1 + 6(n-1) + 6(n-2) + \dots + 6 \cdot 1$

5) $= 1 + 6[(n-1) + (n-2) + \dots + 1]$

6) $= 1 + 6 \cdot \frac{n(n-1)}{2}$

7) $= 3n(n-1) + 1$

We show that

$a_n = 3n(n-1) + 1$

Basis case: $n=1$
IH: True fo $n$, i.e.,

$a_n = 3n(n-1) + 1$

To show $a_{n+1} = 3(n+1) + 1$

now, $a_{n+1} = a_n + 6n$
$\overset{IH}{=} 3n(n-1) + 1 + 6n$
$= 3n(n-1+2) + 1$
$= 3n(n+1) + 1$ ✓