You must calculate the complexity of algorithm

```
sum = 0
for i = 1 to 4n do
    for j = 1 to 4n^2 with step 4 do
        for k = n to 1 with step -2 do
            sum = sum + 1
        end for
    end for
end for
```

Solution:

$$\sum_{i=1}^{4n}\sum_{j=1}^{n^2}\sum_{k=1}^{\frac{n}{2}} O(1) = O(1)\cdot\sum_{i=1}^{4n}\sum_{j=1}^{n^2}\sum_{k=1}^{\frac{n}{2}} 1 = O(1)\cdot\sum_{i=1}^{4n}\sum_{j=1}^{n^2}\frac{n}{2} = O(1)\cdot\frac{n}{2}\cdot\sum_{i=1}^{4n}\sum_{j=1}^{n^2} 1 =$$

$$O(1)\cdot\tfrac{n}{2}\cdot\sum_{i=1}^{4n} n^2 = O(1)\cdot\frac{n}{2}\cdot n^2\cdot\sum_{i=1}^{4n} 1 = O(1)\cdot\frac{n}{2}\cdot n^2\cdot 4n = O(1)\cdot 2n^4$$

The complexity of algorithm is $O(n^4)$. We do not care about constant O(1)*2

Explanation:

- Generally, we put the constants (0, 1, 2, O(1) , …) out of the sum. In this example O(1) is constant. Moreover, when we have this sum $\sum_{i=1}^{n} n$, we can do $n * \sum_{i=1}^{n} 1$

- $\sum_{i=1}^{n} 1$ = (n-1)+1