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HW3

Given $f(n)=2n2+7n+3$, answer the following questions by "yes" or "no". [10 points]

1a.) Yes f(n) = O(n^2)
B. Yes
C. Yes
D. No .
E. No

2. Given $f(n)=7n2+2n+1$, prove that $f(n)=O(n2)$. [10 points]

PROVE:
$f(n)=O(n2)$.

Need to find a constant **c and n(0)** such that

7n^2 + 2n + 1 ≤ **c**(n^2) for all n > **n(0)**

Let c = 10 and k = 1

7n^2 + 2n + 1 ≤ **10**n^2 for all n > **1**

7n^2 ≤ 10n^2 - 2n - 1 for all n > **1**

7n^2 **/n^2** ≤ (10n^2/ **n^2**) - (2n / **n^2**) - (1/**n^2**)

7 ≤ 10 - (2/n) - (1/n^2) for all n > **1**

7 ≤ 10 **TRUE**

Check

Let n = 2 and k = 1 for all n > **1**

7 ≤ 10 - (2/2) - (¼)
7 ≤ 8.75 **TRUE**

Therefore 7n2 + 2n + 1 = O(n2)