7. Data Structures and Algorithms :: Big O Notation :: Example 3

Let $f(n) = -2000n^2 - 5000n + 10000$. Prove that $f(n)$ is $O(n^2)$.

In fact, we could prove quite easily that if $f(n)$ is a quadratic function then $f(n)$ is always $O(n^2)$ and it is not too much of a stretch to prove that if $f(n)$ is *any* degree-p polynomial function $f(n) = c_n n^p + c_{n-1} n^{p-1} + c_{n-2} n^{p-2} + ... + c_1 n + c_0$, then $f(n)$ is $O(n^p)$.