Problem 7:

$2log_{10}(10^{200}), 10^{200}$ → These functions do not contain n, so they are basically constant so O (1)

$n^2 + \sqrt{n},\ n^2 + 7log(n^2),\ n^2\log 300$→ Highest power of n in these functions is n^2 so they are in $O(n^2)$

$n^2\log n$ → Highest power of n in this function is > n^2 and < n^3 so it is in $O(n^2\log n)$

$n^4,\ n^4 + n^2 + n^2\log n$ → highest power of n in these functions is n^4 so they are in $O(n^4)$

3^{n^2} → This is an exponential function, so it is in O (3^{n^2})