CSE 2321 WorkSheet 3 / Practicing for Exam 2

(Please do not share this with anyone)

March 18, 2022

Question 1.

[4 points] Let $f(n) = 2^{(n+10)}$. Does $f(n) = O(2^n)$? Answer by YES or NO. If yes, use the definitions or the properties to show that $f(n)$ is $O(2^n)$. If no, use the proof by contradiction to show that $f(n)$ is not $O(2^n)$.

Question 2.

[3+4+4 points] Use limits to prove the following asymptotic statements.

1. $\sqrt{4n^2 + 1} = \Theta(n)$.
2. $n^n = \Omega(n!)$.
3. $\sqrt{n + 4} - \sqrt{n} = O(1)$.