Problem 3

- According to the definition of big O, a function, $f(n)$ is in $O(g(n))$ if there exists positive real number c and a real number k such that for all $n > k$, $0 < f(n) < c \cdot g(n)$

Applying this to our problem.

$2^{n+1} \leq c \cdot 2^n$

$2^n \times 2 \leq c \cdot 2^n$

So, it appears that, for $c \geq 2$,

$c \cdot 2^n$ will always be $\geq 2^{n+1}$

Hence, for $c \geq 2$, 2^{n+1} is in $O(2^n)$