Question 1

Name: Zoé Baraschi 219665, André Cibils 234840

1. Work = Time on one processor (T_1)
   Here, we are dividing the array in two at each step.
   We can calculate T_1 by summing two parts together: The upper and lower halves.
   Upper half = $2^0 + 2^1 + ... + 2^{n-1} + 2^n$
   Lower half = $2^{n-1} + 2^{n-2} + ... + 2^0$
   $T_1 = 2 * \sum_{i=0}^{n-1} 2^i + 2^n = 2 * (2^n - 1) + 2^n$

2. Critical Path = Time on ∞ processors (T_∞)
   In this case, we can use as many processors as we like.
   $T_\infty = 2 * \log_2(n) + 1$

3. Parallelism = $\frac{T_1}{T_\infty} = \frac{2*(2^n-1)+2^n}{2*\log_2(n)+1}$