CSC236 tutorial exercises, Week #6
best before Thursday evening

These exercises are intended to give you practice with recurrences and using the technique of repeated substitution.

1. Consider the recurrence:
$$T(n) = \begin{cases} 2 & \text{if } n = 1 \\ 2n + T(\lceil n/3 \rceil) & \text{if } n > 1 \end{cases}$$

   Find a closed form for T in the special case where n is a power of 3, that is $\exists k \in \mathbb{N}, n = 3^k$. Use the technique of repeated substitution (aka unwinding) from week 5 slides, or the CSC236 course notes, page 82.

2. Consider the recurrence:
$$R(n) = \begin{cases} 0 & \text{if } n = 1 \\ n + 3R(\lceil n/3 \rceil) & \text{if } n > 1 \end{cases}$$

   Find a closed form for T in the special case where n is a power of 3, that is $\exists k \in \mathbb{N}, n = 3^k$. Use the technique of repeated substitution (aka unwinding) from week 5 slides, or the CSC236 course notes, page 82.