2. [10 points] Consider an outdoor pool initially filled with 20,000 gallons of water. Each day 4% of the water in the pool evaporates. Each morning at 10:00am, $W$ gallons of water are added back to the pool where $W$ is a constant.

a. [3 points] Let $A_n$ be the number of gallons of water in the pool immediately after water is added back to the pool for the $n^{th}$ time. Given that $A_1 = 19200 + W$, find $A_2$ and $A_3$. Put your final answers in the answer blanks.

$$A_2 = \text{_______________________________}$$

$$A_3 = \text{_______________________________}$$

b. [4 points] Find a closed form expression for $A_n$ (i.e. evaluate any sums and solve any recursion). Note your answer may contain the constant $W$.

c. [3 points] If the pool has a maximum capacity of 25,000 gallons, find the largest value of $W$ so that the pool does not overflow eventually.