5. [13 points] Suppose that when a fire alarm is set off in East Hall, the occupants (being mathematicians) leave at precise five-minute intervals. At the end of each interval, 75% of those who were in the building at the beginning of the interval exit the building. Suppose that on a sunny Friday afternoon at 2PM a fire alarm goes off when there are 400 mathematicians in East Hall.

a. [4 points] Find the number of mathematicians that leave at the end of the first, second, and $n$th five-minute intervals.

b. [5 points] Let $L(n)$ be the total number of mathematicians who have left East Hall at the end of the $n$th five-minute interval after the alarm started. Find a closed-form expression for $L(n)$.

c. [4 points] How many mathematicians will leave the building if the alarm goes on forever? (Justify your answer mathematically.)