Math 3342: Homework #6 extra questions

Question 1. Find $\frac{d}{da}\{aba^n\}$.

Question 2. Find $\frac{d}{d1}\{1^n0^m\}$, and write your answer using set notation in as simple a form as you can.

Question 3. Find $\frac{d}{da}\{x \in \{a,b\}^* \mid x \text{ ends with } a\}$. (Beware: in this example, the derivative is not equal to the same language you started with.)

Question 4. Find $\frac{d}{da}\{x \in \{a,b\}^* \mid x \text{ contains the string } aba\}$

Question 5. Let $L = \{x \in \{a,b\}^* \mid x \text{ contains at least one } a\}$. In each part, find the derivative:

a) $\frac{d}{da}L$

b) $\frac{d}{db}L$

c) $\frac{d}{daa}L$

Question 6. Find $\frac{d}{da}\{x^2 \mid x \in \{a,b\}^*\}$, and write your answer using set notation in as simple a form as you can.

Question 7. Find $\frac{d}{db^2}\{xx^R \mid x \in \{a,b\}^*\}$, and write your answer using set notation in as simple a form as you can. Here, x^R means the reverse of x. So for example $(babb)^R = bbab$.