

Math 3342: Homework #5 extra questions

Question 1. Find $\frac{d}{da}\{aba^n\}$, and write your answer using set notation in as simple a form as you can.

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 $\frac{d}{db^2}\{xx^R \mid x \in \{a,b\}^*\}$, 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 $(babb)^R = bbab$.

Question 4. Show that this language is nonregular: $L = \{a^n cb^n c\}$.

Question 5. Show that this language is nonregular: $L = \{a^n b^m \mid m = 3n + 2\}$.

Question 6. Show that this language is nonregular: $L = \{(bab)^n b^n\}$.

Question 7. For the language $L = \{xax^R \mid x \in \Sigma^*\}$:

a) Show that L is regular when $\Sigma = \{a\}$.

b) Show that L is nonregular when Σ has more than 1 element.

Question 8. Show that this language is nonregular: $L = \{a^n \mid n \text{ is a square}\}$.