

Math 3342: Homework #6

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.

Question 4. Show that this language is nonregular: $L = \{a^ncb^nc\}$.

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

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

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

- 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: $L = \{a^n \mid n \text{ is a square}\}$.