

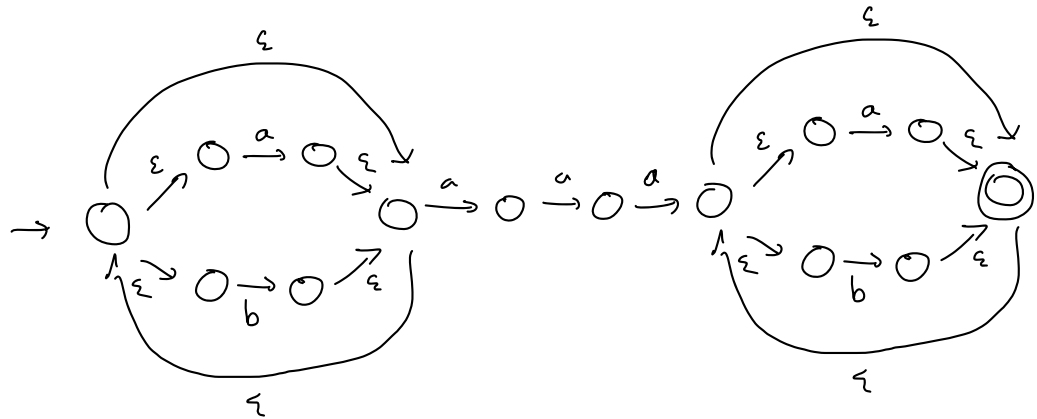
Math 3342

Chapter 7 #1g, 5

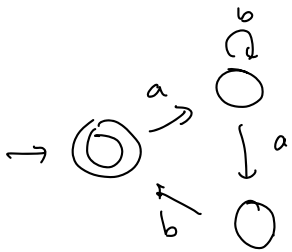
Derivative questions: #3, 7b

#1g regex: $(a+b)^*aaa(a+b)^*$

NFA:



#5



regex: $(ab^*ab)^*$

#4

$L = \{a^n c b^n c\}$ is nonregular.

PF Let $D_i = \frac{\partial}{\partial a^i} L = \{a^{n-i} c b^n c\}$

These are all different, so L is nonregular.

#76 $L = \{ xax^R \mid x \in \Sigma^* \}$ is nonregular when Σ has more than 1 letter.

PF Let $D_i = \frac{d}{da^i} \{ xax^R \}$

$$= \{ y a y^R a^i \mid y \in \{a, b\}^* \}$$

since if x begins with a^i ,
then $xax^R = a^i y a y^R a^i$

as long as a isn't the only letter,

these are all different.

(If a is the only letter, these are all just $\{a^n\}$)