

Math 3342

Homework #8

7, 9, 12, 13

7

read	pop	push
ϵ	S	S_1
ϵ	S	S_2
ϵ	S_1	aS_1a
ϵ	S_1	bS_1b
ϵ	S_1	ϵ
ϵ	S_2	XS_2
ϵ	S_2	X
ϵ	X	a
ϵ	X	b
a	a	ϵ
b	b	ϵ

$(bbb, S) \mapsto (bbb, S_2) \mapsto (bbb, XS_2)$
 $\mapsto (bbb, bXS_2) \mapsto (bb, XS_2)$
 $\mapsto (bb, bS_2) \mapsto (b, S_2)$
 $\mapsto (b, X) \mapsto (b, b) \mapsto (\epsilon, \epsilon)$

9

read	pop	push
ϵ	S	$XS\Upsilon$
ϵ	S	ϵ
ϵ	X	a
ϵ	X	b
ϵ	Υ	c
ϵ	Υ	d
a	a	ϵ
b	b	ϵ
c	c	ϵ

$(abcd, S) \mapsto (abcd, XS\Upsilon) \mapsto (abcd, aS\Upsilon)$
 $\mapsto (bcd, S\Upsilon) \mapsto (bcd, XS\Upsilon\Upsilon)$
 $\mapsto (bcd, bS\Upsilon\Upsilon) \mapsto (cd, S\Upsilon\Upsilon)$
 $\mapsto (cd, \Upsilon\Upsilon) \mapsto (cd, c\Upsilon) \mapsto (d, \Upsilon)$
 $\mapsto (d, d) \mapsto (\epsilon, \epsilon)$

12

$S \rightarrow aOS \mid \epsilon$
 $O \rightarrow aOO \mid b$

$S \rightarrow aOS \rightarrow abS \rightarrow abaOS \rightarrow ababS \rightarrow abab$

13

$$S \rightarrow aSa \mid bSb \mid \varepsilon$$

$$S \rightarrow aSa \rightarrow abSba \rightarrow abba$$