Date . . No.

1. $S \to aS \mid bBb \mid aaA \mid A$
$A \to aaA \mid Aa$
$B \to Bb \mid bba \mid \lambda$

$S \to A$ has to be removed.
$B \to \lambda$ has to be removed.

$\Downarrow$

$S \to aS \mid bBb \mid aaA \mid Aa \mid bb$
$A \to aaA \mid Aa$
$B \to Bb \mid bba \mid b$

A is useless because A never lead to a sentence.

$\Downarrow$

$S \to aS \mid bBb \mid bb$
$B \to Bb \mid bba \mid b$

$\therefore$ $S \to aS \mid bBb \mid bb$
$B \to Bb \mid bba \mid b$

2. $S \to aAbC \mid aaA \mid bbS$
$A \to bbC \mid bb$
$B \to Ab \mid ba \mid \lambda$
$C \to abC \mid C \mid \lambda$

B is useless
$B \to \lambda$, $C \to \lambda$ has to be removed.
$C \to C$ is useless.

$\Downarrow$

$S \to aAbC \mid aaA \mid bbS \mid aAb$
$A \to bbC \mid bb$
$C \to abC \mid ab$

$\therefore$ $S \to aAbC \mid aaA \mid bbS \mid aAb$
$A \to bbC \mid bb$
$C \to abC \mid ab$

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3. We find the grammar is

$S \to aS \mid bBb \mid bb$

$B \to Bb \mid bba \mid b$.

So, the grammar in Chomsky normal form is...

$S \to B_aS \mid D_1B_b \mid B_bB_b$

$D_1 \to bB$

$B \to BB_b \mid D_2B_a \mid b$

$D_2 \to B_bB_b$

$B_a \to a \quad B_b \to b$

$S \to B_aS \mid D_1B_b \mid B_bB_b$

$D_1 \to bB$

$B \to BB_b \mid D_2B_a \mid b$

$D_2 \to B_bB_b$

$B_a \to a \quad B_b \to b$

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4. We find the grammar is...

$S \to aAbC \mid aaA \mid bbS \mid aAb$

$A \to bbC \mid bb$

$C \to abC \mid ab$

So the grammar in Greibach normal form is...

$S \to aAB_bC \mid aB_aA \mid bB_bS \mid aAB_b$

$A \to bB_bC \mid bB_b$

$C \to aB_bC \mid aB_b$

$B_a \to a \quad B_b \to b$

$\therefore$ $S \to aAB_bC \mid aB_aA \mid bB_bS \mid aAB_b$

$A \to bB_bC \mid bB_b$

$C \to aB_bC \mid aB_b$

$B_a \to a$

$B_b \to b$

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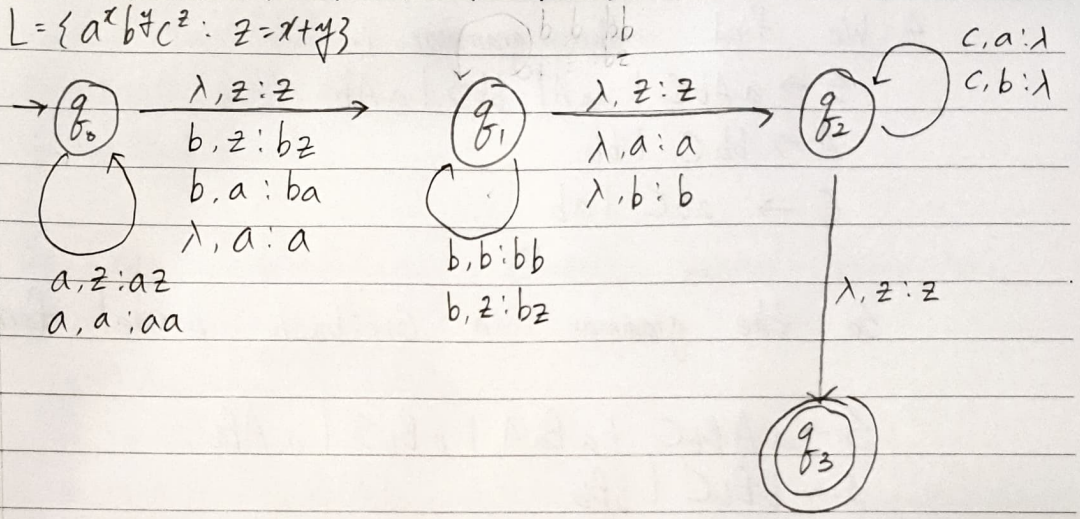
5. $L = \{a^x b^y c^z : z = x+y\}$



6. $L = \{a^n b^n : n \text{ is not a multiple of } 3\}$