A. Let $\Sigma = \{\mathtt{a}, \mathtt{b}\}$. In class we developed a CFG for the language $A \subseteq \Sigma^*$ consisting of strings w that contain twice as many $\mathtt{a}$s as $\mathtt{b}$s. Draw the corresponding PDA, according to the proof of Lemma 2.21. To keep your PDA understandable, use our abbreviated notation for pushing an entire string onto the stack. So your PDA will appear to have just three states, as in Figure 2.24. However, how many states does it actually have?

B. Prove that the intersection of a context-free language and a regular language is a context-free language. Hint: ?esruoc siht ni enod ew evah noitcesretni tuoba sfoorp rehto tahW

C. Show that if A is context-free and B is regular, then A/B is context-free. Hint: .snoitisnart-ϵ ynam sesu noitulos yM .deriuqer era skaewt suoiraV .B/A rof ADP a fo noitcurtsnoc eht ni N dna P esu ,nehT .ylsuoenatlumis M dna P nur ot elba si taht N ADP wen a dliuB .B rof AFD a M dna A rof ADP a eb P teL