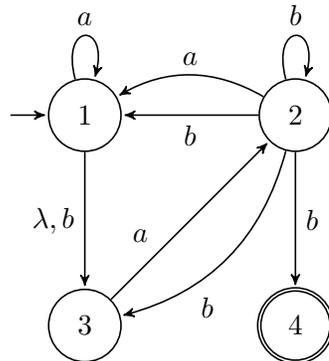


Name: \_\_\_\_\_

**Directions:** Show all work. No credit for answers without work.

1. [3 points] Let  $\Sigma = \{a, b\}$ , and let  $A = \{w \mid \text{the third last and last symbols of } w \text{ are the same}\}$ . For example,  $abab \in A$  but  $aaab \notin A$ . Give an NFA with at most 6 states that computes  $A$ .

2. [3 points] Convert the following NFA to a DFA.



3. [4 points] Let  $\Sigma = \{a, b\}$ , let  $A = \{w \mid w \text{ has an even number of } a\text{'s}\}$ , and let  $B = \{w \mid w \text{ has an odd number of } b\text{'s}\}$ . Give a DFA for the language  $AB$ .