Exercise 3.21.

Consider the following transition table for an NFA with states 1–5 and input alphabet $\{a, b\}$. There are no Λ-transitions:

q	$\delta(q, a)$	$\delta(q, b)$
1	$\{1, 2\}$	$\{1\}$
2	$\{3\}$	$\{3\}$
3	$\{4\}$	$\{4\}$
4	$\{5\}$	$\emptyset$
5	$\emptyset$	$\{5\}$

a. Draw a transition diagram.

b. Calculate $\delta^*(1, ab)$.

c. Calculate $\delta^*(1, abaab)$.

Exercise 3.22.
A transition table is given for an NFA with seven states.

q	$\delta(q,a)$	$\delta(q,b)$	$\delta(q,\Lambda)$
1	$\emptyset$	$\emptyset$	$\{2\}$
2	$\{3\}$	$\emptyset$	$\{5\}$
3	$\emptyset$	$\{4\}$	$\emptyset$
4	$\{4\}$	$\emptyset$	$\{1\}$
5	$\emptyset$	$\{6,7\}$	$\emptyset$
6	$\{5\}$	$\emptyset$	$\emptyset$
7	$\emptyset$	$\emptyset$	$\{1\}$

Find:

d. $\delta^*(1, ba)$

e. $\delta^*(1, ab)$

f. $\delta^*(1, ababa)$

Exercise 3.37.

In each part of Figure 3.36 (on the blackboard) is pictured an NFA.

Use the algorithm from the lecture to draw an NFA with no Λ-transitions accepting the same language.

b.

Exercise 3.40.

Each part of Figure 3.38 (on the blackboard) shows an NFA. Draw an FA accepting the same language.

a.