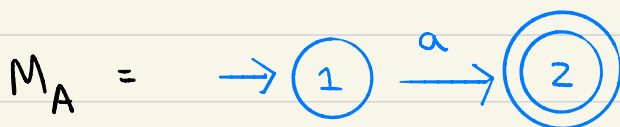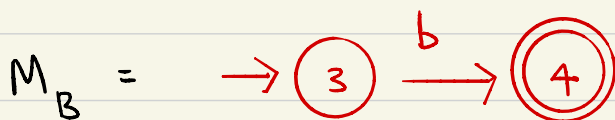# Sample answer for HW5, Part 2, Task 1

$$r = (\underline{a}|\underline{b})^*$$

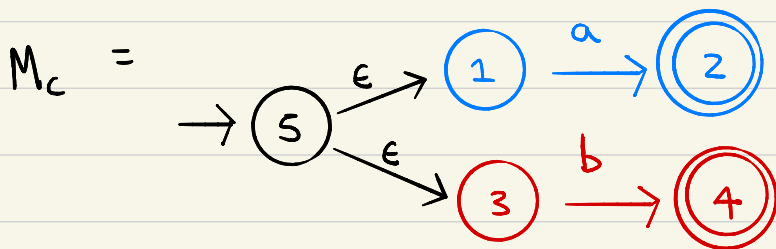(A) Given (2a), M_A generates $[\![\underline{a}]\!]$:

$M_A \ = \ \rightarrow \ \textcircled{1} \ \xrightarrow{a} \ \circledcirc{2}$

(B) Given (2a), M_B generates $[\![\underline{b}]\!]$:

$M_B \ = \ \rightarrow \ \textcircled{3} \ \xrightarrow{b} \ \circledcirc{4}$

(C) Given (2b), (A), and (B), M_C generates $[\![(\underline{a}|\underline{b})]\!]$:

$M_C \ = \ \rightarrow \textcircled{S} \begin{array}{c} \xrightarrow{\epsilon} \textcircled{1} \xrightarrow{a} \circledcirc{2} \\ \xrightarrow{\epsilon} \textcircled{3} \xrightarrow{b} \circledcirc{4} \end{array}$

(D) Given (2d) and (c), M_D generates $[\![(\underline{a}|\underline{b})^*]\!]$:

$M_D =$
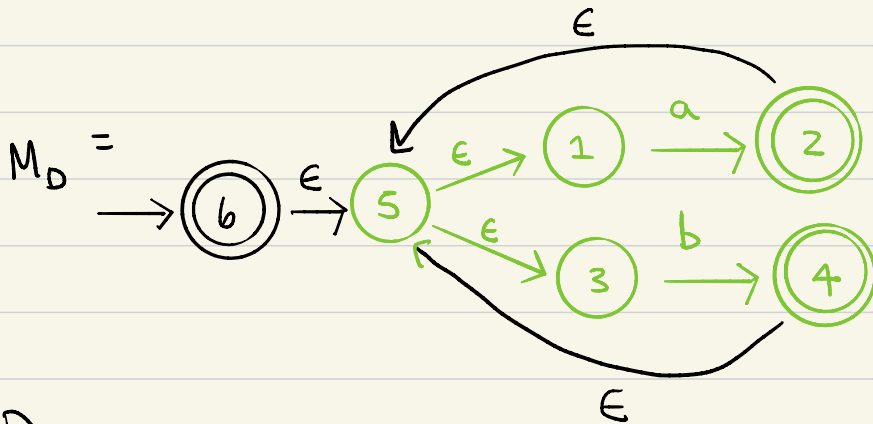
QED.

Note: The color-coding is not necessary in your answer.
It's there for didactic purposes.

(2) refers to (2) on the assignment.