Homework 1 - Written part solution

1. $(bb \mid b \mid \epsilon)(a \mid ab \mid abb)*$

2. $(a|b|c)((a|b|c)(a|b|c))*$

3. The DFA is $(\Sigma\ S\ \delta\ s_0\ F)$ where

$$\begin{array}{rcl}
\Sigma & = & \{a,\ b\} \\
S & = & \{q_0,\ q_1,\ q_2,\ q_3\} \\
\delta & = & \{(q_0,\ a,\ q_1),\ (q_0,\ b,\ q_0),\ (q_1,\ a,\ q_1),\ (q_1,\ b,\ q_2), \\
 & & (q_2,\ a,\ q_2),\ (q_2,\ b,\ q_3),\ (q_3,\ a,\ q_3),\ (q_3,\ b,\ q_3)\} \\
s_0 & = & q_0 \\
F & = & \{q_0,\ q_1,\ q_2\}
\end{array}$$

An equivalent regular expression is $b^* \mid b^*a^+ \mid b^*a^+ba^*$