Problem 2:

$A - B = A \cap \bar{B}$

→ To prove $A-B$ is regular we have to look at three points

① we know that regular languages are closed under union

② Regular languages are closed under complementation

$\bar{A} = \Sigma^* - A$

    Step 1) construct D.F.A for A

    Step 2) Apply complementation algorithm. N.F.A (or) D.F.A
         ∴ It is regular

③ regular languages are closed under Intersection

$A \cap B = \overline{(\bar{A} \cup \bar{B})}$

        ↓
    regular + regular language

$\bar{A} \cup \bar{B}$ — Regular language

$\overline{\bar{A} \cup \bar{B}}$ — Regular language

$A - B = A \cap \bar{B}$

$\bar{B}$ is Regular ∵ Regulars are closed under complementation

$A \cap \bar{B}$ is Regular ∵ Regulars are closed under intersection

∴ $A - B$ is also regular