Q1:

Let x be arbitrary and assume $x \in A \setminus C$,

then $x \in A \cap x \notin C$

Given that $A \subseteq B$, so $\forall x (x \in A \rightarrow x \in B)$,

Since x is arbitrary, $x \in B \cap x \notin C$ holds, then $A \setminus C \subseteq B \setminus C$ is true. □

Q2:

a) $x \neq 3$ could not lead to $x^2 \neq 9$, because if $x = -3$, $x \neq 3$ but $x^2 = 9$. so $x^2 - 9 = 0$ and we cannot divide both sides by $x^2 - 9$.

b) We can pick $x = -3$, $y = 1$ for an counter example, then $x^2 y = 9$, $9y = 9$, $x^2 y = 9y$ and $y \neq 0$.

Q3: To proof that $y \neq 0 \rightarrow x \neq 0$.

Let $x = 0$, given that $xy = 2x^2 - y$, $y = 0$.

Therefore, since $x = 0 \rightarrow y = 0$, $y \neq 0 \rightarrow x \neq 0$ holds. □