Problem:

Prove the identity: $\overline{B\backslash A} = \bar{B} \cup A$.

Solution:

$\bar{A}$ is a complement to the set A, U is a universal set, i.e., $\bar{A} = U\backslash A$.

Let's prove that $A\backslash B = A \cap \bar{B}$. $A\backslash B = \{x \in A, x \notin B\}$.

For any $x \in A\backslash B \Rightarrow x \in A, x \notin B \Rightarrow x \in U\backslash B = \bar{B} \Rightarrow x \in A, x \in \bar{B} \Rightarrow x \in A \cap \bar{B}$.

Similarly, $\forall\, x \in A \cap \bar{B} \Rightarrow x \in A, \ x \in \bar{B} \Rightarrow x \in U\backslash B \Rightarrow x \notin B \Rightarrow x \in A, x \notin B \Rightarrow x \in A\backslash B, \Rightarrow$

$\Rightarrow x \in A\backslash B \Leftrightarrow x \in A \cap \bar{B} \Rightarrow A\backslash B = A \cap \bar{B}\ (*)$.

Now according to De Morgan's law $\Rightarrow \overline{B\backslash A} = \boxed{\text{from } (*) \Rightarrow} = \overline{B \cap \bar{A}} = \bar{B} \cup \bar{\bar{A}} = \boxed{\begin{array}{c}\bar{\bar{A}} = A \text{ is a} \\ \text{double complement}\end{array} \Rightarrow} =$

$\bar{B} \cup A$.