3) Proof. Set $u_1 = l.u.b\, S_1$ and $u_2 = l.u.b\, S_2$ and $S_1 + S_2 = \{x+y \mid x \in S_1, y \in S_2\}$.

Step 1 We will show that u_1+u_2 is an upper bound of S_1+S_2.

Since $x \le u_1$, $y \le u_2$ for all $x \in S_1, y \in S_2$, we can conclude that $x+y \le u_1+u_2$ for all $x \in S_1$ and $y \in S_2$. Hence, u_1+u_2 is an upper bound of S_1+S_2.

Step 2 We will show that u_1+u_2 is the least upper bound of S_1+S_2.

Let $u \in \mathbb{R}$ s.t $u < u_1+u_2$. Since $u-u_2 < u_1$, we can conclude that $u-u_2$ is not an upper bound of S_1. Hence $\exists x \in S_1$ s.t $u-u_2 < x$ ($\Rightarrow u-x < u_2$). Since $u-x < u_2$, it implies that $u-x$ is not an upperbound of S_2. Hence, $\exists y \in S_2$ s.t $u-x < y$. Consequently, $u < x+y$. So, u is not an upperbound of S_1+S_2. Therefore u_1+u_2 is $l.u.b$ of S_1+S_2.