Q7:

It suffices to show that any increasing function is integrable. Let $\varepsilon > 0$. Choose partition P of $[a, b]$ such that for each $S \in P$, $vol(S) < \frac{\varepsilon}{f(b)-f(a)}$. If we let each $S = [x_i, x_{i+1}]$ we compute that

$$
\begin{aligned}
& U(f, P) - L(f, P) \\
&= \sum_{S \in P} [M_S(f) - m_S(f)] \cdot vol(S) \\
&= \sum_{S \in P} [f(x_i) - f(x_{i-1})] \cdot vol(S) && \text{(since f is increasing it attains sup and inf on boundary of S)} \\
&= f(b) - f(a) \cdot vol(S) && \text{(by telescopic summation)} \\
&< \varepsilon
\end{aligned}
$$

Since f is integrable the set of discontinuities must be of measure 0 by Spivak theorem 3-8.