Additional Equicontinuous Problems (part of HW#2)

1. If \( X \subseteq C[a, b] \) is uniformly bounded collection with the property that \( f \in X \) implies \( f'(t) \) exists and
\[
\sup\{|g'(t)| : t \in [a, b], g \in X \} = M < \infty
\]
then \( X \) is relatively compact.

2. If \( X \) and \( Y \) are equicontinuous subsets of \( C[a, b] \) then the following subsets are also equicontinuous:
   
   (a) \( X \cup Y \)
   (b) closure \( X \)
   (c) \( X + Y = \{ f + g : f \in X, g \in Y \} \)

3. Give an example of an equicontinuous set in \( C[a, b] \) that is not relatively compact.