Proofs using the $\varepsilon - \delta$ definition of the derivative

(1) Let $f(x) = 2(x - 1)^2 + \frac{1}{2}$.
   (a) Use the definition of $\frac{df}{dx}(x_0)$ to show that $\frac{df}{dx}(1) = 0$.

   (b) Use the definition of $\frac{df}{dx}(x_0)$ to show that $\frac{df}{dx}(x_0) = 4(x_0 - 1)$. 