Q2: The endpoint of the tangent vector of $\gamma(t)$ will be of the form $\gamma(t) + \gamma'(t) = (t + 1, f(t) + f'(t))$. The tangent line to $(t, f(t))$ will have the equation $y_t(x) = f'(t) \cdot (x - t) + f(t)$. We see that $y_t(t+1) = f'(t) + f(t)$ and conclude that the endpoint of the tangent vector at t belongs to the tangent line to $(t, f(t))$