MAT257 PSET 14—Question 2

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The tangent line of f at t is given by $y = f(t) + xf'(t)$. The tangent vector to the curve $\gamma(t) = (t, f(t))$ is

$$\gamma'(t)_{\gamma(t)} = (1, f'(t))_{(t,f(t))}.$$

The "head" of the tangent vector is $(t, f(t))$ and the "end point" of the tangent vector is at $(t+1, f(t)+f'(t))$. Clearly this point lies on the line $y = f(t) + xf'(t)$ with $x = 1$. Then, $y = f(t) + 1f'(t)$.