Q3: If we let that $\gamma(t) = (\gamma_1(t), \gamma_2(t))$, then we note that since $|\gamma(t)|^2 = 1$, then $\frac{d}{dt}|\gamma(t)|^2 = 0$. For the two vectors in $T_{\gamma(t)}\,\mathbb{R}^2$, $(\gamma(t), \gamma(t))$ and $(\gamma(t), \gamma'(t))$ we compute their inner product as

$$\begin{aligned}
\langle(\gamma(t), \gamma(t)), (\gamma(t), \gamma'(t))\rangle &= \langle \gamma(t), \gamma'(t)\rangle \\
&= \gamma_1(t) \cdot \gamma_1'(t) + \gamma_2(t) \cdot \gamma'(t) \\
&= \frac{1}{2}\frac{d}{dt}|\gamma(t)|^2 \\
&= 0
\end{aligned}$$

Therefore, these tangent vectors are perpendicular.