b) <u>Ortskurve der Wendepunkte</u>

$x = \frac{2}{t}$ $\qquad y = \frac{8}{e^2 t}$

$\Downarrow$

$t = \frac{2}{x}$ $\qquad y = \frac{8}{e^2 \cdot \frac{2}{x}} = \underline{\underline{\frac{4}{e^2} \cdot x}}$

$P(0|0)$ ist kein Wendepunkt, da $t \neq 0$

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c) <u>Wendetangente:</u>

$f'\left(\frac{2}{t}\right) = 4e^{-t \cdot \frac{2}{t}}\left(1 - \frac{2}{t} \cdot t\right) = -4e^{-2}$

$y_t = -4e^{-2}\left(x - \frac{2}{t}\right) + \frac{8}{e^2 t}$

$y_t = -\frac{4}{e^2} x + \frac{8}{e^2 t} + \frac{8}{e^2 t} = -\frac{4}{e^2} x + \frac{16}{e^2 t} \Rightarrow \underline{\underline{P_t\left(0 \middle| \frac{16}{e^2 t}\right)}}$

<u>Normale in W</u>

$y_n = \frac{e^2}{4}\left(x - \frac{2}{t}\right) + \frac{8}{e^2 t} = \frac{e^2}{4} x - \frac{e^2}{2t} + \frac{8}{e^2 t} = \frac{e^2}{4} x + \frac{16 - e^4}{2te^2}$

$\underline{\underline{P_n\left(0 \middle| \frac{16 - e^4}{2te^2}\right)}}$

$|P_t P_n| = \left| \frac{16 - e^4}{2te^2} - \frac{16}{e^2 t} \right| = \left| \frac{16 - e^4 - 32}{2te^2} \right| = \left| \frac{-16 - e^4}{2te^2} \right| = \underline{\underline{\frac{16 + e^4}{2te^2}}}$

$t := \frac{1}{2} \qquad |P_t P_n| = \frac{16 + e^4}{e^2} \approx \underline{\underline{9{,}55\ LE}}$

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d) $F_t(x) = -\frac{4}{t^2}(tx + 1) \cdot e^{-tx}$

$F_t'(x) = -\frac{4}{t^2}\left[t \cdot e^{-tx} - t \cdot e^{-tx}(tx + 1)\right]$

$= -\frac{4}{t^2}\left[t \cdot e^{-tx} - t^2 x \cdot e^{-tx} - t e^{-tx}\right]$

$= -\frac{4}{t^2}\left[-t^2 x \cdot e^{-tx}\right] = \underline{\underline{4x \cdot e^{-tx}}}$ $\qquad$ q.e.d.