Consider the curve given by the following parametric equations.

\[ x = 2e^{3t} + t^2, \quad y = 5e^{2t}, \quad 0 \leq t \leq 1 \]

1. (4 points) Find a formula for \( \frac{dy}{dx} \). Your answer can be written in terms of \( t \).

2. (2 points) What is the equation of the line tangent to the curve at the point \( (2, 5) \)?
3. (4 points) Set up, but do not evaluate, an integral with respect to $t$ which represents either one of the following quantities. If you answer both, we’ll grade you only on your best answer.

(a) The length of the curve on the given interval.

-or-

(b) The area between the $x$-axis and the curve on the given interval.