1. At a certain factory, the total cost (in dollars) of manufacturing $q$ tables during the daily production run is

$$C(q) = 0.2q^2 + 10q + 900$$

From experience, it has been determined that approximately

$$q(t) = t^2 + 99t$$

tables are manufactured during the first $t$ hours of a production run.

Make sure to indicate the units of your answer in each question below.

(a) Calculate $C'(50)$ and explain its precise meaning.

(b) Compute the rate at which the total manufacturing cost is changing with respect to time one hour after production begins.
2. Calculate \( \frac{d}{dx} \left( 4x^3e^{\sin(2x)} \right) \). After computing the derivative, do not simplify your answer.