1. (2 points each) Evaluate the following indefinite integrals.

(a) \[ \int \frac{x^5 + x^3 + 2}{x^2 + 1} \, dx \]

(b) \[ \int \tan(x) \csc(2x) \, dx \]
2. (2 points) Evaluate the following definite integral. Simplify your answer.

\[ \int_1^3 2x^{-3} \left( x^2 + 18 \right) \, dx \]

3. (2 points) Suppose \( g(x) = \int_4^x e^{\frac{3t}{2}} \, dt \). Find \( g'(x) \).
4. (2 points) At time $t$ minutes, the altitude of a drone is changing at a rate of $10 \sin (t) + 20 \cos (t)$ feet per minute. If the altitude of the drone is 200 feet at time $t = \frac{\pi}{2}$ minutes, then what is its altitude at time $t = 2\pi$ minutes? Simplify your answer.