ANTIDERIVATIVES

(1) If \( f''(x) = \sin x \) and \( f'(0) = 1 \) and \( f(0) = 2 \), determine \( f \).

(2) If \( f''(x) = \sqrt{x} \) and \( f'(1) = 2 \) and \( f(1) = 1 \) determine \( f \).

(3) If \( f(x) = \left( \frac{9}{x} - 3e^{-4x} \right) \), determine the general antiderivative function \( F(x) \).

(4) If \( f(x) = 5x - 5^x \), find the general antiderivative function \( F(x) \).

(5) If \( f(x) = \frac{\sqrt{y} - y}{y^2} \), find the general antiderivative function \( F(x) \).
(6) If \( f(x) = \frac{x^4 + x^2 + 6}{x^2 + 1} \), determine the general antiderivative function \( F(x) \).

(7) You throw a rock off a cliff. It hits the ground 2 seconds later. How high is the cliff, assuming no air resistance?

(8) (4.9 no. 77) A car is traveling at 100kph when the driver sees a deer 80m ahead and slams on the brakes. What constant deceleration is required to stop the car in time to avoid the deer?