

Integrating Differential Equations- HW Problems

Solve the following differential equations.

1. $\frac{dy}{dx} = \frac{2}{x^3}$; $y(1) = 3$

2. $\frac{dy}{dx} = xe^{(x^2)}$; $y(0) = 2$.

In problems 3 and 4 find the position function $x(t)$ given the acceleration function $a(t)$, initial velocity $v_0 = v(0)$, and initial position, $x_0 = x(0)$.

3. $a(t) = -2$, $v_0 = 10$, $x_0 = -4$

4. $a(t) = 6t + 1$, $v_0 = -3$, $x_0 = 2$.

5. At time $t = 0$ the brakes of a car are applied to a car travelling at $22.2m/sec$ ($\approx 80km/hr$). The car decelerates at a constant rate of $20m/sec^2$. Calculate how far the car travels before it comes to a stop.