Chapter 6, Solution 75.

An op amp differentiator has ***R***= 250 kΩ and ***C*** = 10 μF. The input voltage is a ramp ***r(t)*** = 12 ***t*** mV. Find the output voltage.

Solution

$$v_0 = -RC\frac{dv_i}{dt}, \quad RC = 250x10^3 x10x10^{-6} = 2.5$$

$$v_o = -2.5\frac{d}{dt}(12t) = \textbf{–30 mV}$$