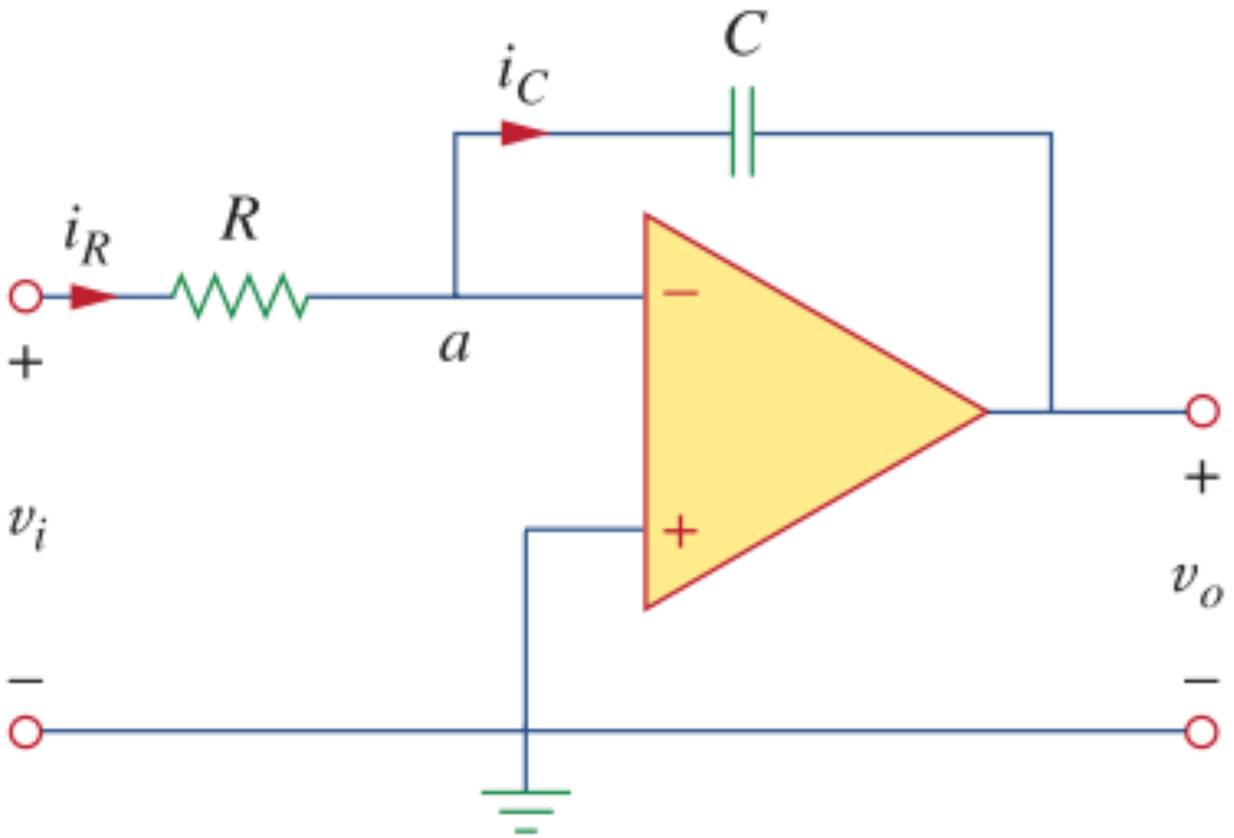
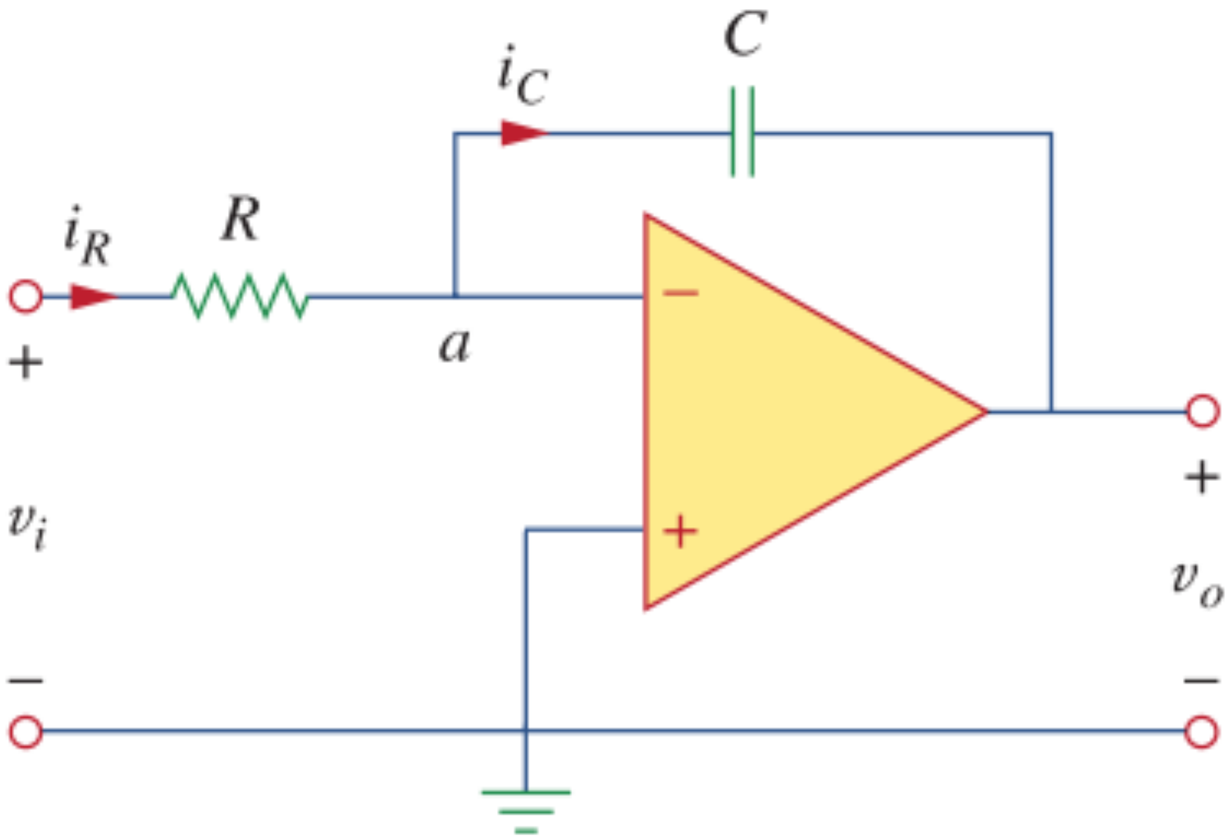

C
i_C
i_R
R
a
+
v_i
−
−
+
+
v_o
−



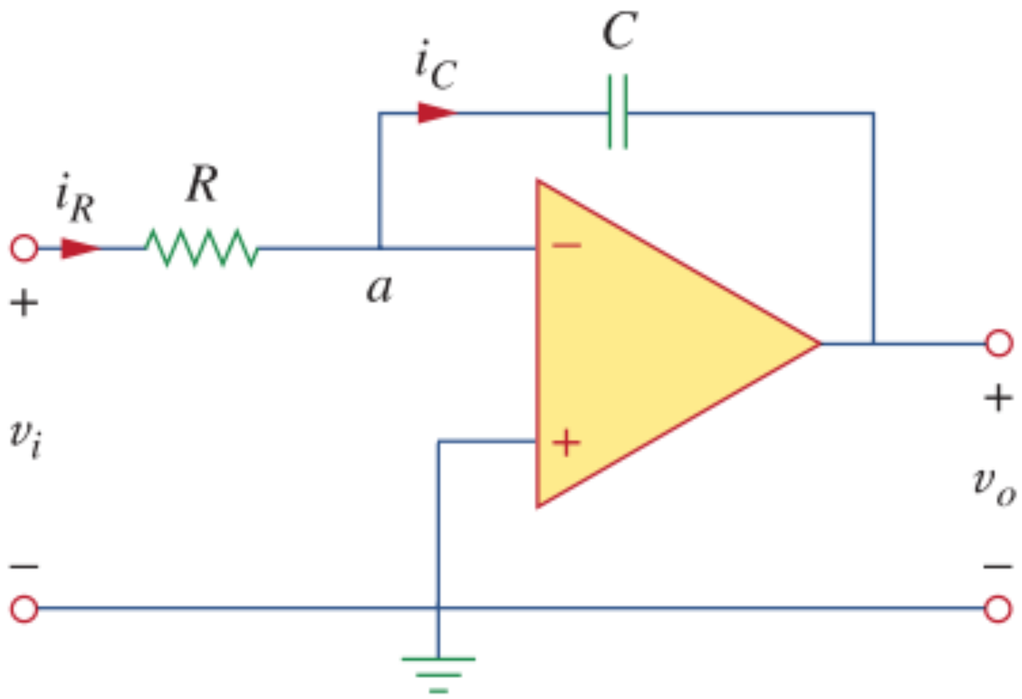
$$i_R = i_C$$

$$\frac{V_i}{R} = C\frac{dV_c}{dt} = -C\frac{dV_0}{dt}$$

$$\frac{dV_o(t)}{dt} = -\frac{1}{RC}V_i(t)$$

$$V_o(t) = -\frac{1}{RC}\int_0^t V_i(t)dt + V_o(0)$$

Integrator

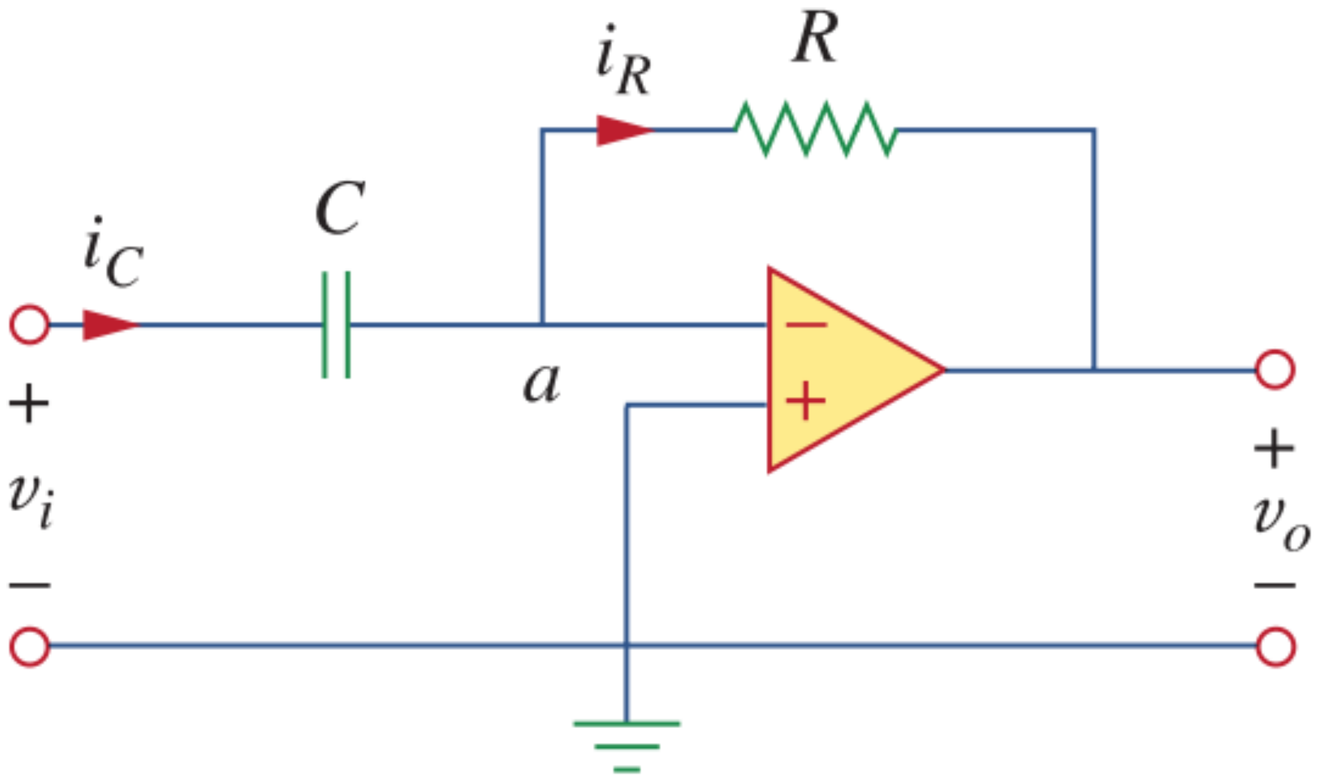


$$V_0(t) = \frac{-1}{RC} \int_0^t V_i \; dt + I.C.$$

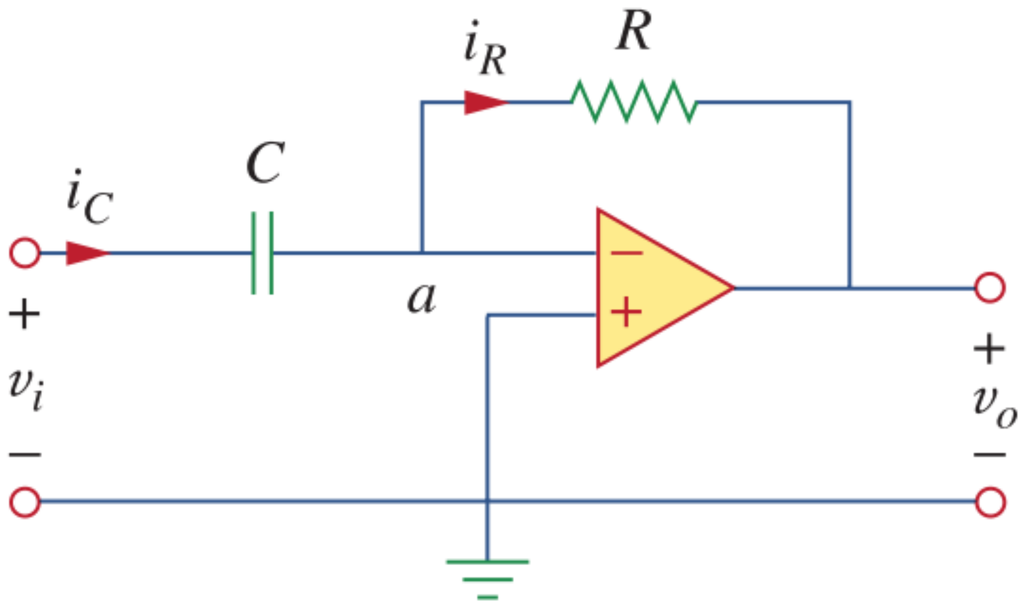
$$i_R = i_C$$

$$C\frac{dV_c}{dt} = C\frac{dV_i}{dt} = -\frac{V_o}{R}$$

$$V_o(t) = -RC\frac{dV_i(t)}{dt}$$



Differentiator



$$V_0(t) = -RC\frac{dV_i}{dt}$$