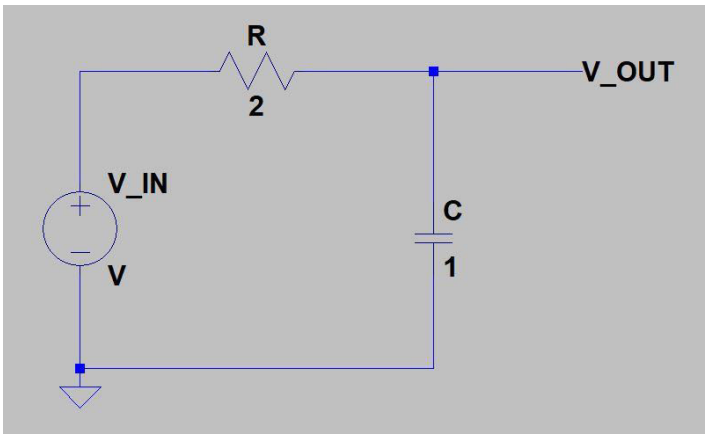
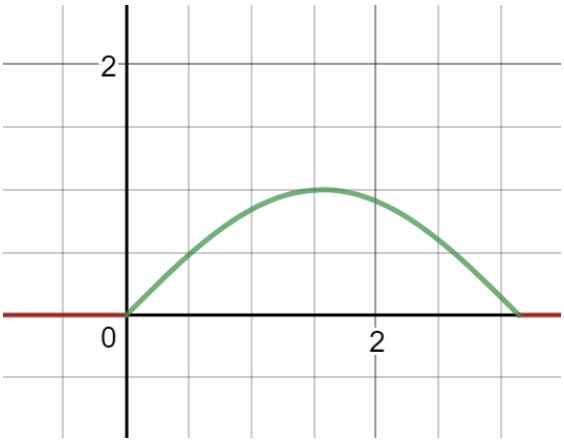
Tutorial 1

Q1.5.d





$$i_C = C\frac{dV_{OUT}}{dt} = C\cos t = \cos t$$

$$\rightarrow V_{IN} = V_R + V_C = Ri_R + V_C = Ri_C + V_{OUT} = 2\cos t + \sin t$$

The Input voltage, V_{IN} can be completed as follows:

$$V_{IN} = \begin{cases} 0\,; & t < 0 \\ 2\cos t + \sin t\,; & 0 < t < \pi \\ 0\,; & t > \pi \end{cases}$$

$$V_{IN} = (2\cos t + \sin t)(u(t) - u(t-\pi))$$