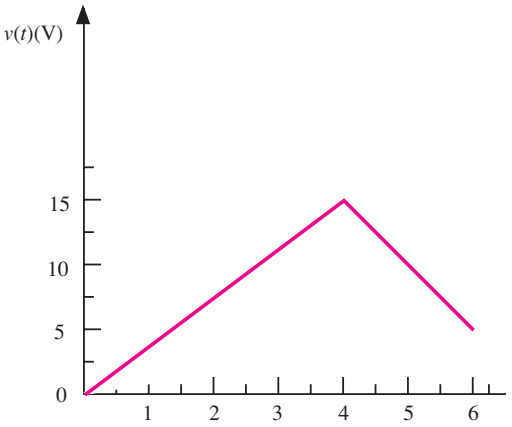

Figure P4.24

4.25 In the circuit shown in Figure P4.25, let

$$i(t) = \begin{cases} 0 & \text{for } -\infty < t < 0 \\ t & \text{for } 0 \le t < 1 \text{ s} \\ -(t-2) & \text{for } 1 \text{ s} \le t < 2 \text{ s} \\ 0 & \text{for } 2 \text{ s} \le t < \infty \end{cases}$$

Find the energy stored in the inductor for all time.

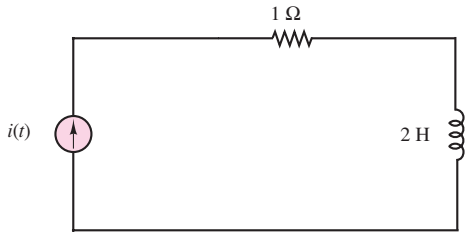

Figure P4.25

4.26 In the circuit shown in Figure P4.26, let

$$v(t) = \begin{cases} 0 & \text{for } -\infty < t < 0 \\ 2t & \text{for } 0 \le t < 1 \text{ s} \\ -(2t-4) & \text{for } 1 \le t < 2 \text{ s} \\ 0 & \text{for } 2 \text{ s} \le t < \infty \end{cases}$$

Find the energy stored in the capacitor for all time.

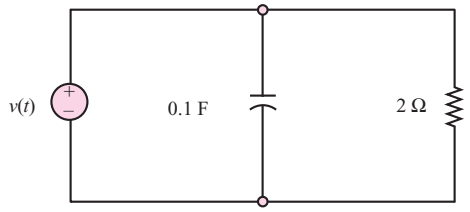

Figure P4.26

4.27 Use the defining law for a capacitor to find the current $i_C(t)$ corresponding to the voltage shown in Figure P4.27. Sketch your result.

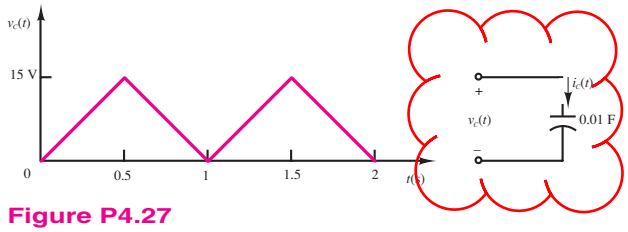

Figure P4.27

4.28 Use the defining law for an inductor to find the current $i_L(t)$ corresponding to the voltage shown in Figure P4.28. Sketch your result.

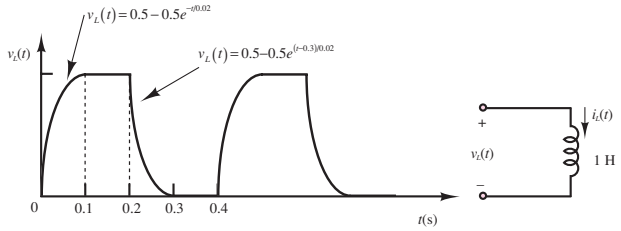

Figure P4.28

Section 4.2 Time-Dependent Signals

4.29 Find the average and rms value of $x(t)$.

$$x(t) = 2\cos(\omega t) + 2.5$$

4.30 A controlled rectifier circuit is generating the waveform of Figure P4.30 starting from a sinusoidal voltage of 110 V rms. Find the average and rms voltage.

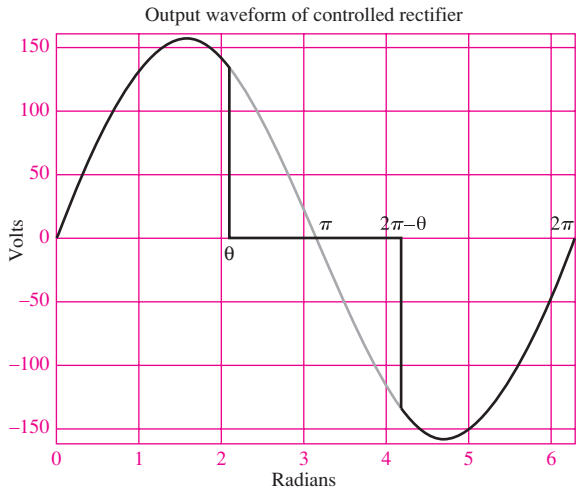

Figure P4.30