Find the energy received by this element between time t = 0 and t = T1.

For this element

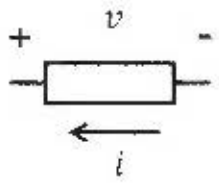
$$v(t) = 2\pi \cdot \cos(A1 \cdot \pi \cdot t) \quad V$$

$$i(t) = A2 \cdot \sin(A1 \cdot \pi \cdot t)$$

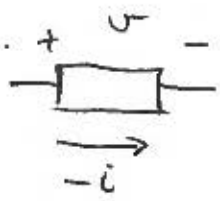
A1 = 1 Hz

A2 = 5 A

T1 = 1.5 s



(Note: Hz is the unit used for frequency. It is equal to s^{-1})



for passive sign convention ⇒ gives power received

$$p(t) = v(t) \cdot (-i(t)) = -2\pi \cos(\pi t) \cdot 5 \sin(\pi t)$$

$$= -10\pi \sin(\pi t)\cos(\pi t) = -5\pi \sin(2\pi t)$$

$$E = \int_0^{1.5} p(t)\,dt = -5\pi \int_0^{1.5} \sin(2\pi t)\,dt = \frac{-5\pi}{2\pi} \int_0^{1.5} \sin(2\pi t)\,d(2\pi t)$$

$$= -\frac{5}{2}\left(-\cos(2\pi t)\right)_0^{1.5}$$

$$= -2.5\left(-\cos(3\pi t) + 1\right)$$

$$= -2.5\left(-(-1) + 1\right)$$

$$= -5$$

$$\boxed{E = -5\ \text{J}}$$ received