1.b)

$$a_0 = \int_{-T/4}^{0} x(t)\,dt + \int_{0}^{T/4} x(t)\,dt$$

$$= \int_{-T/4}^{0} 1/4 + t \,.dt \;+ \int_{0}^{T/4} \frac{1}{4} - t \,.dt$$

$$\left(\frac{t}{4} + \frac{t^2}{2}\right)\Bigg|_{-T/4}^{0} + \left(\frac{t}{4} - \frac{t^2}{2}\right)\Bigg|_{0}^{T/4}$$

$T = 1$

$$= -\left(-\frac{1}{16} + \frac{1}{32}\right) + \left(\frac{1}{16} - \frac{1}{32}\right)$$

$$= \frac{1}{16} - \frac{1}{32} + \frac{1}{16} - \frac{1}{32}$$

$$= \frac{1}{8} - \frac{1}{16} = \frac{1}{16}.$$

$$a_0 = 1/16.$$