3.

a. $f(t) = \begin{cases} -2, & -1 \le t \le 1 \\ 0, & 1 \le t \le 3 \end{cases}$

Periode = 4

b. $f(t) = \begin{cases} -2 \\ 0 \end{cases}$

$f(-t) = \begin{cases} -2 \\ 0 \end{cases} = f(t) \rightarrow$ fungsi genap

$$a_0 = \frac{1}{P} \int_P f(t)\, dt$$

$$= \frac{1}{4} \int_{-1}^{3} f(t)\, dt$$

$$= \frac{1}{4} \left(\int_{-1}^{1} -2\, dt + \int_{1}^{3} 0\, dt \right)$$

$$= \frac{1}{4} \left(-2t \Big|_{-1}^{1} + 0 \Big|_{1}^{3} \right)$$

$$= \frac{1}{4} \left(-2.1 - (-2.-1) \right)$$

$$a_0 = \frac{1}{4}(-4) = -1$$

$$a_n = \frac{1}{P} \int_P f(t).\cos.\frac{2\pi n t}{P}.\, dt$$

$$= \frac{1}{4} \int_{-1}^{3} f(t).\cos \frac{2\pi n t}{4_2}\, dt$$

$$= \frac{1}{4} \left(\int_{-1}^{1} -2 \cos \frac{\pi n t}{2}\, dt + \int_{1}^{3} 0.\cos \frac{\pi n t}{2}\, dt \right)$$

$$= \frac{1}{4} \left(-\frac{4}{\pi n} \sin \frac{\pi n t}{2} \Big|_{-1}^{1} + 0 \Big|_{1}^{3} \right)$$

$$a_n = \frac{1}{4} \left(-\frac{4}{\pi n} \sin \frac{\pi n}{2} + \frac{4}{\pi n} \sin \frac{-\pi n}{2} \right) = -\frac{2}{\pi n} \sin \frac{\pi n}{2}$$

$b_n = 0$, karena fungsi genap

c. $f(t) = a_0 + a_1 \cos \frac{\pi t}{P} + a_2 \cos \frac{2\pi t}{P} + \dots + a_n \cos \frac{n\pi t}{P}$

$= -1 + \frac{2}{\pi} \cos \frac{\pi t}{4} + 0 \cdot \cos \frac{2\pi t}{4} - \frac{2}{3\pi} \cos \frac{3\pi t}{4} + 0 \cdot \cos \frac{4\pi t}{4} + \dots$

$= -1 + \frac{2}{\pi} \cos \frac{\pi t}{4} - \frac{2}{3\pi} \cos \frac{3\pi t}{4} + \frac{2}{5\pi} \cos \frac{5\pi t}{4} + \dots$