Problem A.2:

$x_3(t):$ $\quad T_0 = 40 \rightarrow W_0 = \dfrac{2\pi}{40} = \dfrac{\pi}{20}$

$$x_3(t) = \sum_{n=-\infty}^{\infty} D_n e^{j\frac{n\pi}{20}t}$$

$$D_n = \frac{1}{40} \int_{T_0} x_3(t) e^{-j\frac{n\pi}{20}t} dt$$

$$D_n = \frac{10}{40} \int_{-5}^{5} e^{-j\frac{n\pi}{20}t} dt = \frac{1}{4} \int_{-5}^{5} e^{-j\frac{n\pi}{20}t} dt$$

$$= \left[\frac{1}{4}\left(\frac{-20}{jn\pi}\right) e^{-j\frac{n\pi}{20}t} \right]_{t=-5}^{5} \qquad = \left[\frac{-5}{jn\pi} e^{-j\frac{n\pi}{20}t} \right]_{t=-5}^{5}$$

$$= \frac{-5}{jn\pi} e^{-j\frac{n\pi}{4}} + \frac{5}{jn\pi} e^{j\frac{n\pi}{4}} = \frac{10}{n\pi}\left[\frac{e^{j\frac{n\pi}{4}}}{j2} - \frac{e^{-j\frac{n\pi}{4}}}{j2} \right]$$

$$\boxed{D_n = \frac{10\sin\left(\frac{\pi}{4}n\right)}{n\pi}}$$