

ECE103 HW#5 Oct.29, 2018

[1].

5.15. Find the following convolutions:

- $\text{sinc}(t) * \text{sinc}(2t)$
- $\text{sinc}^2(2t) * \text{sinc}(t)$
- $\text{sinc}(2t) * e^{jt} \text{sinc}(t)$

[2].

5.20.

- Find and sketch the frequency spectrum of the half-wave rectified cosine waveform shown in **Figure P5.20(a)**.

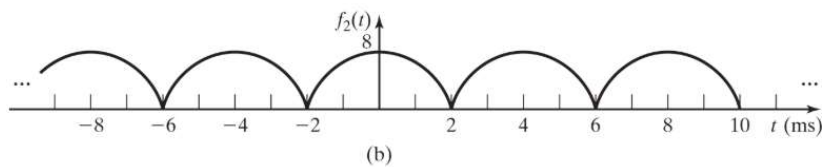
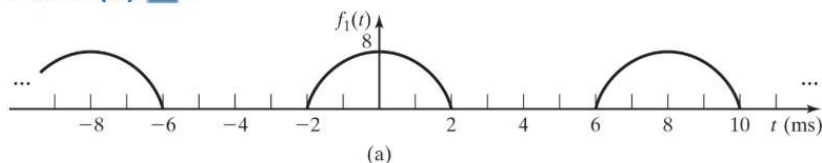


Figure P5.20

- Find and sketch the frequency spectrum of the full-wave rectified cosine wave form shown in **Figure P5.20(b)**.
- Compare the results of Parts (a) and (b).
- How would the frequency spectra be changed if the period of each waveform in Parts (a) and (b) was halved?

[3].

5.21.

- The periodic signal $g_p(t)$ is shown in [Figure P5.21](#). Find and sketch $G_p(\omega)$.
- How would the frequency spectrum change if the period of the waveform was doubled?

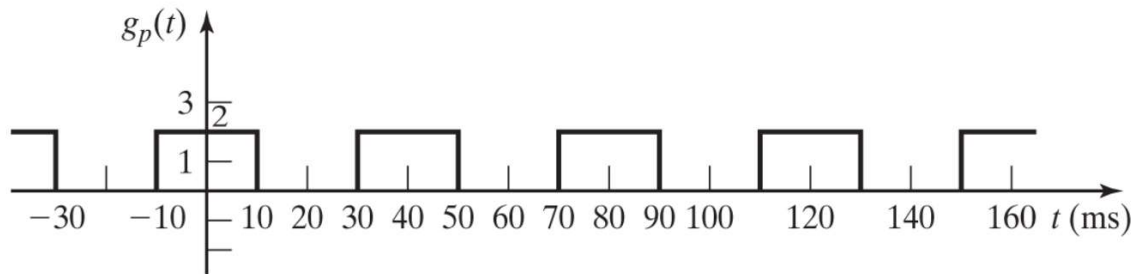


Figure P5.21

[4].

5.28.

- a. A power signal with the power spectral density shown in **Figure P5.28(a)** is the input to a linear system with the frequency response shown in **Figure P5.28(b)**. Calculate and sketch the power spectral density of the system's output signal.

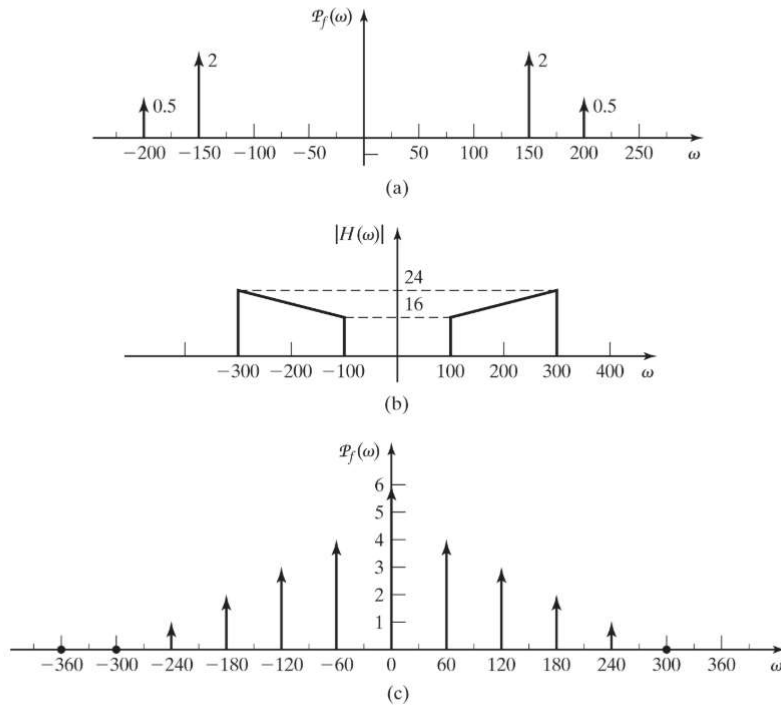


Figure P5.28