Example 3-2: The plots in Fig. **??** illustrate several points about the spectrum for the sum of two signals. The spectrum of $x_1(t)$ is shown in Fig. **??**(a), and the spectrum of $x_2(t)$ in Fig. **??**(b). When adding the spectra, we see that both spectra have components at the frequencies $f = \pm 7$ and 0, so three phasor additions must be done.

$$
\begin{aligned}
3 + 3e^{j\pi} &= 0 && \text{(at } f = 0\text{)} \\
4e^{-j\pi/4} + 4e^{j\pi/4} &= 4\sqrt{2} && \text{(at } f = -7\text{)} \\
4e^{j\pi/4} + 4e^{-j\pi/4} &= 4\sqrt{2} && \text{(at } f = 7\text{)}
\end{aligned}
$$

Since the complex amplitudes at $f = 0$ cancel out, there is no DC component in the sum spectrum of Fig. **??**(c). The spectrum for $x_1(t)$ has components at $f = \pm 2$, but the spectrum for $x_2(t)$ does not, so those components are copied directly to the sum spectrum. Likewise, the components at $f = \pm 5$ in the spectrum for $x_2(t)$ are also copied to the sum spectrum.

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