7.3 QUIZ QUESTION 1 (1/1 point)

The product $\cos(2\pi f_1 t) \cdot e^{j\cdot 2\pi f_2 t}$ can also be written as

- $0.5e^{j\cdot 2\pi(f_1+f_2)t} - 0.5e^{j\cdot 2\pi(f_1-f_2)t}$
- $0.5e^{j\cdot 2\pi(f_1+f_2)t} + 0.5e^{j\cdot 2\pi(-f_1+f_2)t}$ ✔
- $0.5e^{j\cdot 2\pi(f_1+f_2)t} + 0.5e^{j\cdot 2\pi(-f_1-f_2)t}$
- $0.5e^{j\cdot 2\pi(f_1+f_2)t} + 0.5e^{j\cdot 2\pi(f_1-f_2)t}$

EXPLANATION

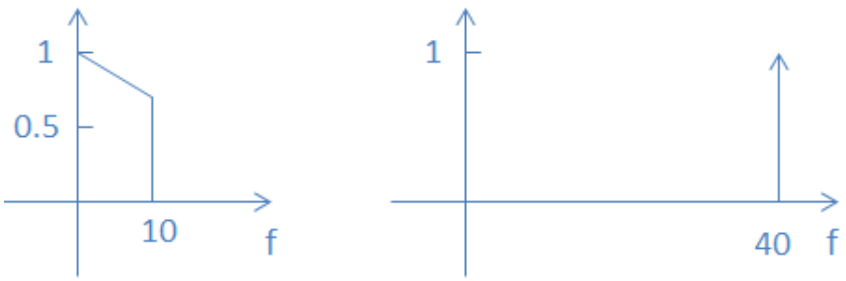
Since $\cos(2\pi f_1 t) = 0.5e^{j2\pi f_1 t} + 0.5e^{-j2\pi f_1 t}$,

$$\begin{aligned}\cos(2\pi f_1 t) \cdot e^{j\cdot 2\pi f_2 t} &= \left(0.5e^{j2\pi f_1 t} + 0.5e^{-j2\pi f_1 t}\right) e^{j\cdot 2\pi f_2 t} \\ &= 0.5e^{j2\pi(f_1+f_2)t} + 0.5e^{j2\pi(-f_1+f_2)t}\end{aligned}$$

You have used 1 of 2 submissions

7.3 QUIZ QUESTION 2 (1/1 point)

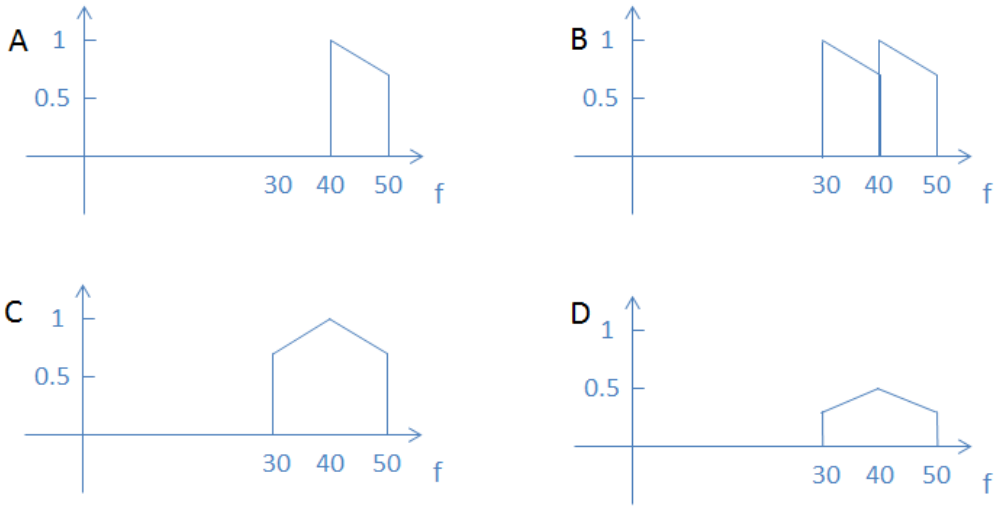
Consider the two signals whose Fourier Series Spectrum as shown below. Assume that the units of frequency are kiloHertz (kHz).



What is the Fourier Series Spectrum of the product of these two signals?

7.3 Modulation with Complex Exponentials
Week 4 Quiz due Nov 23, 2015 at 15:30 UTC

- Topic 8: Signal Transmission - Demodulation
- MATLAB download and tutorials
- MATLAB Sandbox



- Spectrum A
- Spectrum B
- Spectrum C
- Spectrum D ✔

EXPLANATION

The right hand side signal with only a single frequency component is a cosinusoidal signal at 40kHz. Multiplying the signal on the left by this cosine shifts the spectrum up to around 40kHz, but there are two symmetric copies of each frequency component f1 on the left at 40+f1 and 40-f1, each with half the amplitude.

You have used 1 of 2 submissions