c) $x(t) = 2 \sin(25000\pi t) \cos 50\pi t$

$= \sin(25050\pi t) + \sin(24950\pi t)$

$= \sin(2\pi f_1 t) + \sin(2\pi f_2 t)$

Two sinusoids at $f_1 = \frac{25050}{2}$ Hz and $f_2 = \frac{24950}{2}$ Hz.

Taking $f_c = \frac{f_1+f_2}{2} = \frac{25}{2}$ kHz, and

$W = \frac{f_2 - f_1}{2} = 25$ Hz.

we have $f_1 = f_c - W$ and $f_2 = f_c + W$

$x(t) = \text{Re}\left(-j e^{j2\pi(f_c - W)t} - j e^{j2\pi(f_c+W)t}\right)$

$\therefore \tilde{x}(t) = -j\left(e^{j2\pi Wt} + e^{-j2\pi Wt}\right)$

$= -2j \cos 2\pi Wt.$

$= -2j \cos 50\pi t.$

One need not always choose f_c to be the midpoint. You can choose f_c to be f_1 or f_2 also, or any other frequency between f_1 and f_2.