Example 3-7: If we let $v(t) = 5 + 4\cos(40\pi t)$ and $f_c = 200$ Hz, then the AM signal is a multiplication similar to the beat signal:

$$x(t) = [5 + 4\cos(40\pi t)]\ \cos(400\pi t) \tag{3.4}$$

The signal $v(t)$ has a DC term large enough to make $v(t)$ positive for all t. A plot of $x(t)$ is given in Fig. **??**(b), where it can be seen that the effect of multiplying the higher-frequency carrier sinusoid (200 Hz) by the lower-frequency sinusoid (at 20 Hz) is to "modulate" (or change) the amplitude envelope of the carrier waveform—hence the name amplitude modulation for a signal like $x(t)$ in Fig. 3-7.

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