

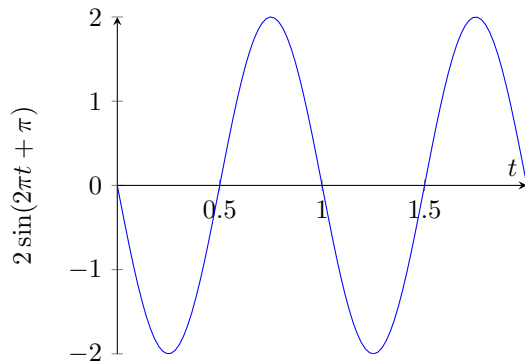
# Lab Sound Basics Solutions

September 15, 2021

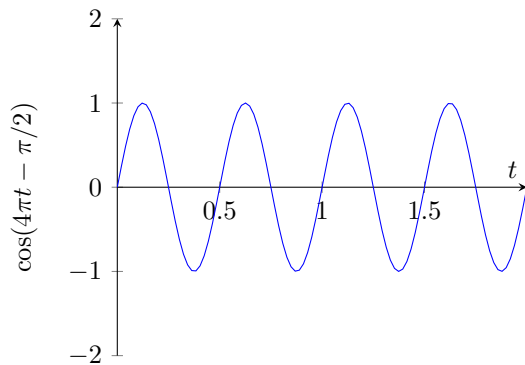
## Handwritten Exercises

### 1. Graphs

(a)  $2 \sin(2\pi t + \pi)$



(b)  $\cos(4\pi t - \pi/2)$



2. Harmonics: 200Hz, 400Hz, 600Hz, 800Hz, 1000Hz

3.  $\frac{1}{2}f(x + \frac{\pi}{2})$

4. One octaves above: 880Hz. Two octaves above: 1760Hz. Three octaves above: 3520Hz

5. The easiest way to probably think about this is what is the greatest common factor of the notes. That will tell us the harmonic series we are in.

(a) 300Hz

(b) 150Hz. Note that the presence of 450Hz changes the fundamental from 300Hz. This will be an auditory illusion where the perceived fundamental does not exist.