

# Assignment 9

Due: 11/27/2017

(1) Consider the pure tone  $s(t) = 10 \sin(2\pi \times 3t)$ ,

- (a) What is the fundamental frequency?
- (b) Graph this sound in the time domain. Make sure to label the  $x$ -axis and  $y$ -axis correctly.
- (c) Graph the spectrum of this sound.

(2) Consider a sound represented by the following function:

$$s(t) = \sin(2\pi \times 100t) + 2 \sin(2\pi \times 200t) + 4 \sin(2\pi \times 400t) + 5 \sin(2\pi \times 1800t).$$

- (a) What is the fundamental frequency and what are the overtones?
- (b) Graph the spectrum of this sound.

(3) Suppose you want to record a 3 second sound using 5 bits and a sampling rate of 8 samples per second. Label the axes of the time domain graph like we did in class. You do **not** have to plot any sound waves. The axes should have a “tick” showing where each bit is on the  $y$ -axis and where each sample will be recorded on the  $x$ -axis.