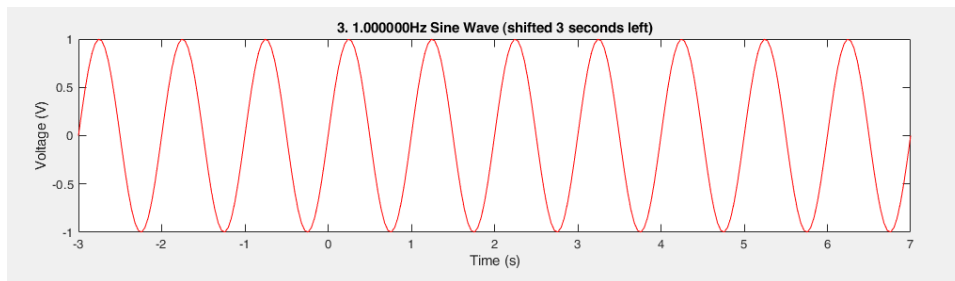
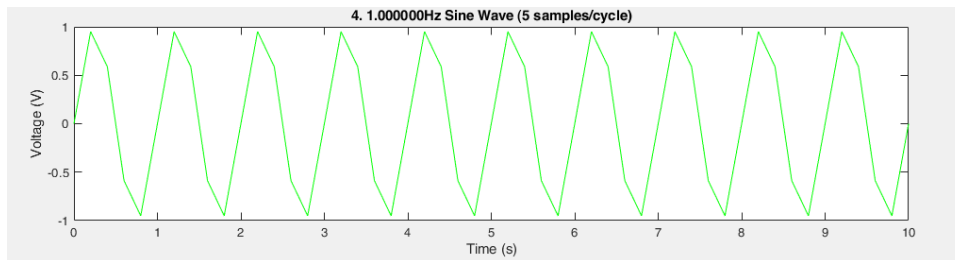


1.

2. Samples/sec: 25.1



3.



4.

5.

0.351660	0.830829	0.585264	0.549724	0.917194
0.285839	0.757200	0.753729	0.380446	0.567822
0.075854	0.053950	0.530798	0.779167	0.934011
0.129906	0.568824	0.469391	0.011902	0.337123

hw1.m

```

1 % Author: Charlie Coleman
2 % Date: 2019-1-22
3 % Course: Mobile Robotics
4 freq = 1;
5 [y, x] = gen_sine(freq);
6
7 samples_sec = length(y)/(x(end)-x(1));
8 fprintf('2. Samples/sec: %f\n', samples_sec);
9
10 [y2, x2] = gen_sine(freq, 10, 5);
11
12 figure
13 subplot(3,1,1);
14 plot(x, y);
15 title(sprintf('1. %fHz Sine Wave', freq));

```

```

16 xlabel('Time (s)');
17 ylabel('Voltage (V)');
18
19 subplot(3,1,2);
20 plot(x-3, y, 'r');
21 title(sprintf('3. %fHz Sine Wave (shifted 3 seconds left)', freq));
22 xlabel('Time (s)');
23 ylabel('Voltage (V)');
24
25 subplot(3, 1, 3);
26 plot(x2, y2, 'g');
27 title(sprintf('4. %fHz Sine Wave (5 samples/cycle)', freq));
28 xlabel('Time (s)');
29 ylabel('Voltage (V)');
30
31 rand_nums = rand(1, 20);
32 disp('5. ');
33 for i = 0:3
34     s = sprintf('\t%f %f %f %f %f', rand_nums(5*i+1:5*(i+1)));
35     disp(s);
36 end

```

gen_sine.m

```

1 % Author: Charlie Coleman
2 % Date: 2019-1-22
3 % Course: Mobile Robotics
4 function [y, x] = gen_sine(freq, cycles, samples)
5     if ~exist('cycles', 'var')
6         cycles = 10;
7     end
8     if ~exist('samples', 'var')
9         samples = 25;
10    end
11    x = 0:1/(samples*freq):cycles/freq;
12    y = sin(2*pi*freq*x);
13 end

```