

NAME: \_\_\_\_\_

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Pre-Lab 7:

Physics 1320

Profs. Tunks / Olness

*THIS IS SIMPLE, AND YOU MUST DO IT BY HAND. NO CREDIT FOR COMPUTER PLOTS.*

**Problem #1)**  $x(t) = 100 \sin[1 t] + 50 \sin[2 t] + 33 \sin[3 t]$ .

You are given the above wave form  $x(t) = 100 \sin[1 t] + 50 \sin[2 t] + 33 \sin[3 t]$ .

You will SKETCH (that means roughly accurate, but no overly so) both a time-domain and frequency-domain graph.

Let's start with the time-domain graph. Set up your axes so that the horizontal axis runs from  $t=[0, 2\pi]$  seconds, and your vertical axis running from -200 to +200.

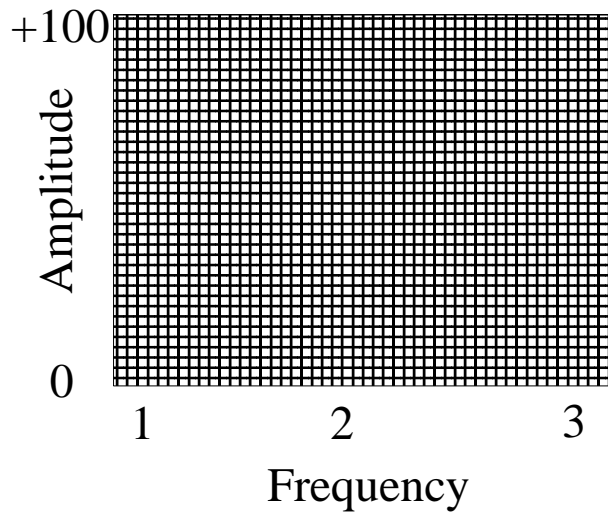
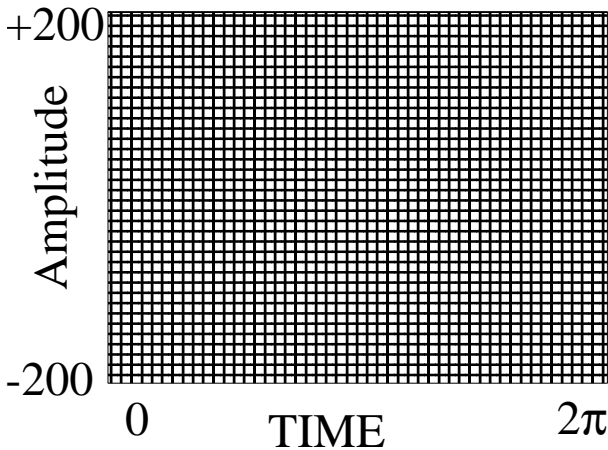
First sketch  $100 \sin[t]$  over the time interval  $t=[0, 2\pi]$  seconds.

Next, sketch  $50 \sin[2 t]$  on the same plot.

Then, sketch  $33 \sin[3 t]$  on the same plot.

Then, by eye, add up the three curves, and sketch this with a dark line.

*A sample is shown below. (Do this on a large sheet of paper.)*



Next, let's do the frequency-domain graph. Set up your axes so that the horizontal axis runs from frequency =1 to 3, and your vertical axis from 0 to 100.

For each of the 3 frequencies {1,2,3}, make a bar chart showing the appropriate amplitude {100,50,30}.

**Problem #2) Repeat the above exercise for:**

$$x(t) = 100 \sin[1 t] + 0 \sin[2 t] + 33 \sin[3 t].$$