30 ***Communication***
4 Work recorded in notebook (rather than pasted in)
8 Complete information: task descriptions, diagrams, data, reproducible one year later
4 Written in Ink
4 Student Signed every page
4 Student Dated every page
6 TA Signature for every lab session (-3 each session missed)

6 VI. CONSTRUCTION AND TESTING OF PRE-AMPS [Lab 1a (last section)]
A. *Construction*
1 Explanation of task (constructed pre-amps circuits on breadboard)
1 Schematic of pre-amps
1 Explanation of testing (1 V 1 kHz sinusoid in, oscilloscope measure output)
B. *Drawing of Waveforms*
3 Careful drawing of oscilloscope screen

6 V. DEMONSTRATING THE NEED FOR PRE-AMPS [Lab 1b]
B. *Procedure*
1 Explanation of task (measured voltages for electrode model v-divider)
2 Table II-A filled in with measured values
1 Explanation of task (measured voltages for pre-amp model v-divider)
2 Table II-B filled in with measured values

22 VI. DERIVING AN EXPRESSION FOR THE DIFFERENTIAL AMPLIFIER OUTPUT
A. *Deriving the Expression for v_3*
1 Explanation of task (deriving expression for output of diff-amp)
1 Schematic of differential-amp
15 Derivations: v_+, v_-, and v_3
B. *Differential Gain*
5 Derivation of v_3 in terms of $\Re$

24 VII. DESIGNING, BUILDING, AND TESTING THE DIFFERENTIAL AMPLIFIER
A. *Resistor values for a gain of 500*
4 Explanation of how R_1, R_2, R_3, and R_4 chosen
2 List of values for R_1, R_2, R_3, and R_4
B. *Building and Testing the Differential Amplifier*
1 Schematic (for circuit in Fig. 6 or for own circuit layout)
1 Explanation of test procedure including 6 V power supply and v-divider
3 Table of values of measured diff-amp output vs input 1 voltage
3 Table of values of measured diff-amp output vs input 2 voltage
C. *Measuring the Gain of the Differential Amplifier*
4 Plot of v_3 vs $v_2 - v_1$
4 `polyfit()` straight line fit of data
2 Calculation of gain of differential amplifier

12VIII. MEASURING AND ANALYZING EMG'S
A. *Measuring EMG's*
1 Explanation of task (used electrodes on biceps to measure EMG)
5 Printout of EMG waveform on oscilloscope
B. *Power versus Weight for EMG signals*
1 Explanation of task (Matlab® calculation of power in EMG waveform)
C. *Plot of EMG Power versus Weight*
5 Matlab® plot of power vs weight