Physics 4700 HOMEWORK 2
Due February 1

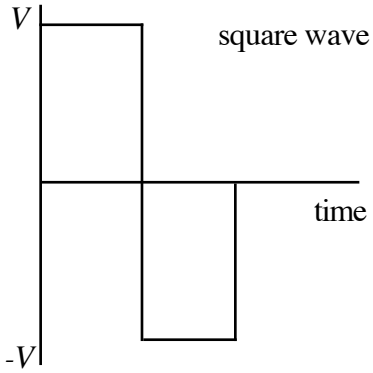
1) Simpson P50, problem 32.

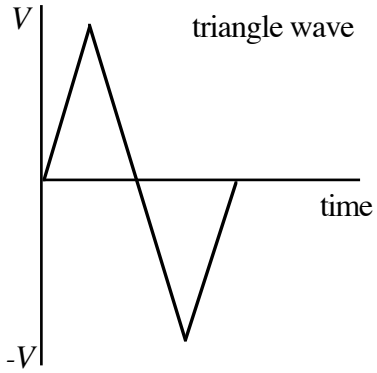
2) This is a review problem on complex numbers. Manipulating complex numbers will become important when we discuss AC circuits.

Let: $A = 2 + 4j$
$B = -1 + 3j$
$C = 3 - 2j$
Find the magnitude and phase of:
a) A, B, and C
b) $(A + C)/B$
c) $(2A - 3B^*)/(A - C^*)$, * = complex conjugate

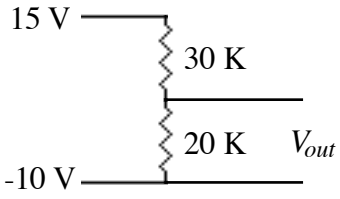
3) A current of 1 mA charges a 1 μF capacitor. How long does it take the cap. to reach 10 V?

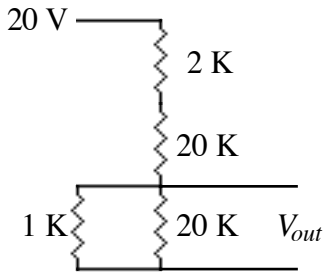
4) Simpson P103, problem 2. Also calculate V_{RMS} for the following waveforms:





5) Simpson P104, problem 10.
6) Simpson P104, problem 12.
7) Simpson P105, problem 14.
8) Simpson P105, problem 15. The rise time is defined on page 107 of Simpson.
9) Draw the Thevenin equivalent circuit for the following two circuits:
(note: the load resistor has already been taken out of the circuit, if it were in the circuit, it would be across the V_{out} terminals).





10) Simpson P105, problem 23.