Name:

| Problem	Points	Score
1a	10	
1b	10	
2a	10	
2b	10	
2c	10	
3a	10	
3b	10	
3c	10	
3d	10	
3e	10	
Total	100	

Notes:

1. The exam is closed books/closed notes - except for one page of notes.

2. Please show ALL work. Incorrect answers with no supporting explanations or work will be given no partial credit.

3. Please indicate clearly your answer to the problem. If I can't read it (and I am the judge of legibility), it is wrong. If I can't follow your solution (and I get lost easily), it is wrong. All things being equal, neat and legible work will get the higher grade:)

Problem No. 1: Show the following properties of the Fourier transform for **real** signals:

(a) $|X(f)| = |X(-f)|$

(b) $\theta(f) = -\theta(f)$

Problem No. 2: For the following two signals:
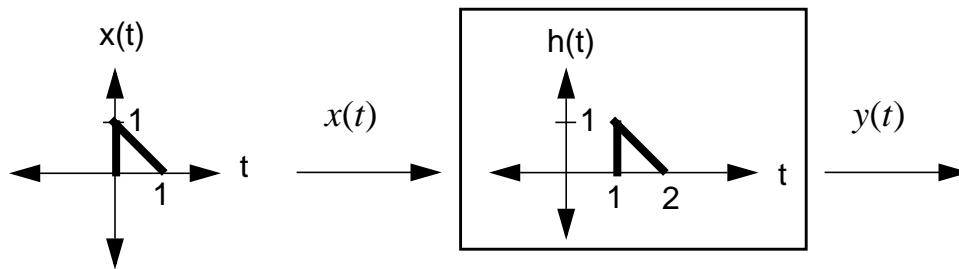
$$x(t) \qquad\qquad\qquad y(t)$$
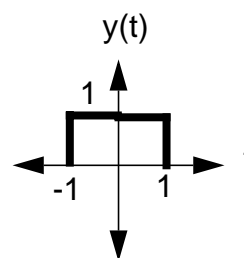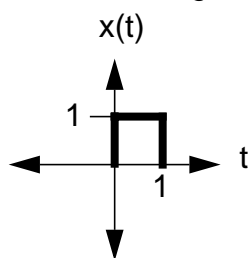
(a) Plot the magnitude spectrum of $x(t)$:

(b) Plot the magnitude spectrum of $y(t)$:

(c) Compare and contrast these plots (note that you can answer this question correctly without getting the correct answers for (a) and (b).
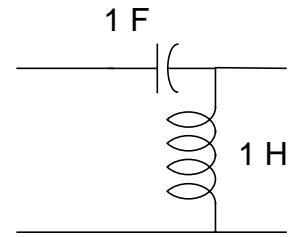
Problem No. 3: For the following system,

(a) Find $X(s)$:

(b) Find $Y(s)$:

1 F

(c) For the circuit shown, construct the Bode magnitude plot.

1 H

(d) How many poles and zeros does the system have?

(e) Using concepts introduced in Chaps. 4 - 6, determine the stability of the system.