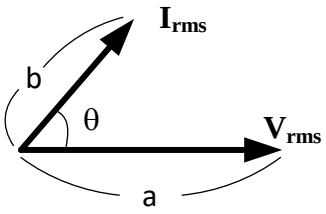
Quiz #6 [50pts] (20min) Name _____ ID _____

1. Consider the below phasor diagram where rms voltage vector has a length of *a* and rms current vector has a length of *b*. Find the average power, reactive power, power factor and apparent power. Express your answer using *a*, *b* and θ. [12pts]



Average power =

Reactive power =

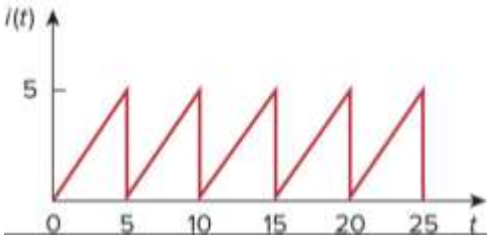
Power factor =

Apparent power =

2. What are the units of your answer to Problem 1? [3pts]
   Average power: _____, Reactive power: _____ , Apparent Power: _____

3. [11.13] The Thevenin impedance of a source is $Z_{TH} = 1 + j\ \Omega$ while the peak Thevenin voltage is V_{TH}=10+j0 V. Determine the maximum available average power from the source. [6pts]

4. [11.27] What is the rms value of the current waveform shown below? [6pts]



5. [11.47] Find the complex power, the average power and the reactive power. [6pts]

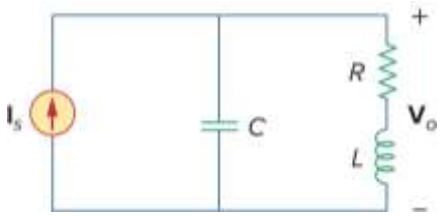
$v(t) = \sin(377t+45^o)$ V $i(t) = \sin(377t)$ A.

Complex power = _____

Average power = _____

Reactive power = _____

6. [14.5] For the circuit as shown below, find $H(s) = V_o/I_s$. (You do not need to expand equations. e.g.) $R_1R_2/(R_1+R_2)$ can be expressed as $R_1||R_2$.) [7pts]



7. [14.13] Construct the Magnitude Bode plot for $G(s) = \dfrac{0.1(s+1)}{s^2(s+10)}$ where s=jω [10pts]