ENGR 12 Assignment 10 Due: next wed

**Part I. Drills -- 1 point each**For questions 1 and 2, assume a = 3 – 4j, b = –6j, c = 8<-45 o, d = 15<250o

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| 1. Express the following in Rectangular form:
	1. (a + b)
	2. ( a / b)
	3. c
	4. c\* (complex conjugate of c)
	5. (c + d)
 | 1. Express the following in Polar form:
	1. b
	2. b\* (that's the complex conjugate of b)
	3. c/d
	4. a b
	5. a + d
 |

1. Complete the missing cells of the table defining three sinusoids and express each as
 $i\left(t\right)= Im cos⁡(ωt+ φ)$


2. Use the concept of a phasor to convert the following expressions into a simpler form:
	1. 100cos(500t – 43 o) + 45cos(500t + 120 o)
	2. 200cos(377t + 75 o) + 50sin(377t – 100 o)
	3. 5cos(wt) + 5cos(wt+120 o) + 5cos(wt-120 o)

1. Find the complex impedance AND admittance of the following at a-b, given w = 5000 Radians/sec, express in both polar and rectangular form:
a) b)

 

 **Part II. Assisted Problem Solving – 2 pts**

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| 1. Find the the current through the 25nF cap in 5a) when a current source of 10cos(5000t + 120o) is applied at a-b.

Express your answer in both phasor and time-domain form | Plan1. Convert the source current into phasor form
2. Use the current divider formula to find phasor Ic
3. Convert phasor Ic to time domain
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| 1. Find the voltage across the 2.5mF cap in 5b) when a voltage source of 50cos(5000t – 90 o) is applied at a-b.

Express your answer in both phasor and time-domain form | PLAN1. Convert the source voltage into phasor form
2. Use the voltage divider formula to find phasor Vc
3. Convert phasor Vc to time domain
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**Part III. Unassisted Problem Solving – 3 points**

8) What value of w will the impedance at a-b in problem 5b become purely resistive?