



## PROBLEM:

Simplify the following and give the answer in polar form. Make a plot of the vectors involved in the complex addition.

(a)  $z_a = \sqrt{2} e^{-j(3\pi/4)} + e^{j\pi/2}$

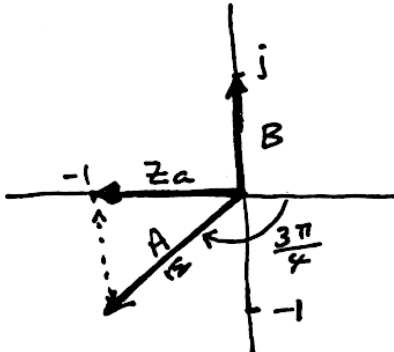
(b)  $z_b = e^{j(3\pi/2)} + \sqrt{3} e^{j6\pi}$

(c) In addition, write the MATLAB statements that will perform the addition and also display the magnitude and phase of the result. Use these to check your hand calculations in parts (a) and (b).



$$(a) \quad z_a = \overbrace{(-1-j)}^A + \overbrace{(j)}^B = -1 = e^{-j\pi/2}$$

$$(b) \quad z_b = \overbrace{(-j)}^C + \overbrace{(\sqrt{3})}^D = 2 e^{-j0.5236}$$



(a) » a=sqrt(2)\*exp(-i\*3\*pi/4)

a = MATLAB

-1.0000 - 1.0000i

» b=exp(i\*pi/2)

b =

0.0000 + 1.0000i

» c=a+b

c =

-1.0000 - 0.0000i

» abs(c)

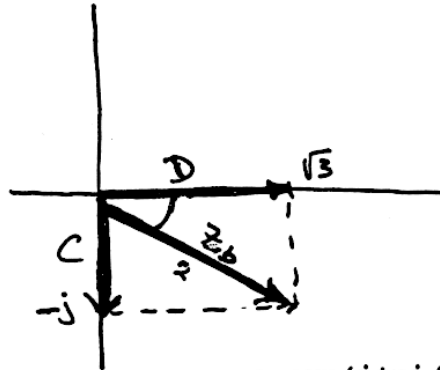
ans =

1.0000

» angle(c)

ans =

-3.1416



(b)

» a=exp(j\*pi/2\*3)

a = MATLAB

-0.0000 - 1.0000i

» b=sqrt(3)\*exp(j\*6\*pi)

b =

1.7321 - 0.0000i

» zb=a+b

zb =

1.7321 - 1.0000i

» Mzb=abs(zb)

Mzb =

2.0000

» angle(zb)

ans =

-0.5236