
PROB 1: Use the phasor transform (see formula below) to find the requested quantities for each of the following signals.

Phasor Transform: $A\cos(\omega t+\phi)\xleftrightarrow[P[\,]]{} Ae^{j\phi}$ where $j\equiv\sqrt{-1}$

a) Find A and ϕ for

$$v(t)=3\cos(1000t+45°)\xleftrightarrow[P[\,]]{} Ae^{j\phi}.$$

b) Find A and ϕ for

$$v(t)=2\cos(3000t-30°)\xleftrightarrow[P[\,]]{} Ae^{j\phi}.$$

c) Find A for

$$v(t)=A\cos(100t+60°)\xleftrightarrow[P[\,]]{} 4e^{j\pi/3}.$$

d) Find A and ϕ for

$$v(t)=8\cos(440t+\phi)\xleftrightarrow[P[\,]]{} Ae^{-j225°}.$$

PROB 2: Use the trigonometry of a right triangle to translate complex numbers from polar form to rectangular form or vice versa to solve the following problems.

Rectangular-to-Polar conversion: $a+jb=\sqrt{a^2+b^2}\,e^{j\tan^{-1}(b/a)}=Ae^{j\phi}$

Polar-to-Rectangular conversion: $Ae^{j\phi}=A\cos\phi+jA\sin\phi=a+jb$

a) Find a and b for

$$3e^{j\pi/6}=a+bi.$$

b) Find A and ϕ for

$$Ae^{j\phi}=3+j4.$$