

ECS 303: Quiz 3 solution

Semester/Year: 2/2009

Course Title: Basic Electrical Engineering

Name	ID

Instructions

1. Separate into groups of no more than three persons.
2. Closed book. Closed notes.
3. Only one submission is needed for each group. Late submission will not be accepted.
4. **Do not panic.**

1. Transform these sinusoids to phasors (in polar form)

(a) $5\cos(t - 45^\circ)$


$5 \angle -45^\circ$

(b) $-5\sin(t - 45^\circ) = -5\cos(t - 45^\circ - 90^\circ) = 5\cos(t - 45^\circ - 90^\circ + 180^\circ)$
 $= 5\cos(t + 45^\circ) \Rightarrow$ $5 \angle 45^\circ$

2. Find the sinusoids represented by these phasors

(a) $4 - 4j$

$= 4\sqrt{2} \angle -45^\circ$



\Rightarrow $4\sqrt{2} \cos(\omega t - 45^\circ)$

(b) $-je^{j45^\circ} = -j\exp(j45^\circ) = (1 \angle -90^\circ)(1 \angle 45^\circ) = 1 \angle -45^\circ$

$-j = 1 \angle -90^\circ$

\Rightarrow $\cos(\omega t - 45^\circ)$

Note that this is the same as

$\cos(\omega t + 315^\circ)$

and

$\sin(\omega t + 45^\circ)$

but we usually answer in cosine form with positive amplitude and phase between -180° to 180° .